RAPPORTS

ET

PROCÈS-VERBAUX DES RÉUNIONS

VOLUME CXXVII

2EME PARTIE

RAPPORT ADMINISTRATIF

(1948)

REPORT

of

ADMINISTRATION FOR THE YEAR ENDING OCTOBER 31st 1949

I. General.

Composition of the International Council for the Exploration of the Sea.

At the last Meeting of the International Council, in October 1948, Dr. K. A. Andersson was elected President in place of Professor Johan Hjort, and the vacancy thereby created in the Bureau was filled by the election of Dr. A. Ramalho.

For the present Meeting the following countries have appointed new Delegates: Eire: Mr. E. D. Toner in place of Mr. O'Driscoll, and Sweden: Dr. B. Kullenberg in place of Professor Hans Pettersson.

Composition of the Bureau.

The Bureau consists of: Dr. K. A. Andersson, President, Mr. A. T. A. Dobson, 1st Vice-President, M. Pierre Tissier, Mr. G. J. Lienesch and Dr. A. Ramalho, Vice-Presidents. Mr. Henry G. Maurice is Président d'Honneur with the right to attend the Bureau Meetings.

Committees.

A list of Committees will be found in part I, pp. 28—31. These Committees remain in being and no change has been announced up to date. At its meeting in May the Bureau decided to set up an Editorial Committee consisting of the President, Mr. Dobson, Dr. Clark, Dr. Ramalho and the General Secretary. The Bureau further decided that the Finance Committee should have a meeting during the Council Meeting.

Meetings.

Meetings of the Bureau took place in October, 1948, and in May, 1949, in Copenhagen. These meetings were attended by all Members of the Bureau except M. Pierre Tissier for whom Professor J. le Gall substituted, as well as by the General Secretary and the Chairman of the Consultative Committee.

No other meetings have this year been summoned by the Council, but the Atlantic Committee has held two meetings: the first at the invitation of the Spanish Government, at Malaga from May 23rd to 27th, and the second at the invitation of the Residentship of Tunis, at Salammbô from July 27th to 30th. These meetings were concerned with the study of the tunnies. The Chairman of the Atlantic Committee has handed over to the General Secretary a report of these meetings and their recommendations, one of which proposes that the important reports placed before the two conferences should be published under the care of the International Council, and another that the participants in the said meetings should give an account of the attitude of their respective Governments concerning the proposals for an international cruise and the organisation of a "Commission Internationale du Thon" at the meeting of the Atlantic Committee in Edinburgh. (See the recommendations in the Appendix, p. 7.)

In the course of the spring of 1949 it was decided by correspondence to hold a Herring Expert Meeting in Edinburgh prior to the Council Meeting.

Statement of Accounts.

The Statement of Accounts gives rise to the following remarks:

Expenditure.

Item II. On this item there has been a saving of about 1000 Kr. on account of the General Secretary's leave of absence for two and a half months without honorarium, on the other hand somewhat more has been used for salaries on account of the price-index. The price-index also accounts for the increase of about 300 Kr. in relation to the Estimates on item III. Item IV, Office Expenses. About 1,150.— Kr. has been saved on this item. Item V. Travelling Expenses have exceeded Estimates by some 200 Kr.

Item VI, Publications: The following publications are already paid: balance of the cost of *Annales Biologiques*, IV, the greater part of which was paid in 1947—48, *Rapports et Procès-Verbaux* Vols. No. 123 and 124, *Journal du Conseil* Vol. XVI, 1, *Bulletin*

Income and Expenditure Account for the year 1/11 1948—31/10 1949.

EXPENDITURE

	D. kr.	D. kr.
I. Incidentals		
1. President	6,000.00	
2. Editor of the Journal	3,000.00	
3. Assistance to Editor of the Journal	1,500.00	
4. Chairman of Consultative Committee	4,000.00	
5. Chairmen and Vice-Chairman of Committees	32,000.00	
6. Editor for Statistics	2,000.00	
7. Editor of Plankton Sheets	1,000.00	
		49,500.00
II. Headquarter Staff		
1. General Secretary	7,462.04	
2. Biological Assistant	3,384.69	
3. Assistant Secretary	9,413.38	
4. Editorial Secretary	8,666.72	
5. Statistical Secretary	7,313.38	
6. Clerical Assistant	6.624.74	
7. Clerical Assistance	5,224.77	
		48,089.72
III. Hydrographical Staff		
1. Hydrographer	11,624.06	
2. Clerical Assistance	5,224.77	
3. Assistance	1,445.00	
		18,293.83
IV. Office Expenses		
1. Rent	5.580,00	
2. Light and Heating	1,123.83	
3. Stationery, books, etc.	1,856.19	
4. Telephone, telegrams, postage etc.	1,848.13	
5. Furniture and Fittings	474.01	
6. Insurance	448.86	
7. Upkeep, cleaning etc.	2,965.60	
8. Miscellaneous	3,548.70	
		17,845.32
V. Travelling Expenses		18,179.02
VI. Printing and Distribution		
1. Printing	55,665.02	
2. Drawings, translations etc.	775.21	
3. Distribution	548.88	
		56,989.11
VII. Pensions		4,242.10
VIII. Extraordinary Expenses		
Pension to Professor KNUDSEN	1,166.66	
Mrs. HJORT, half a year President's Incidentals	3,000.00	
Miss BRØNNICHE's Jubilee	500.00	
Card Index work	1,500.00	
Statistical Assistance	407.50	
		6,574.16
Extraordinary cost-of-living bonus		2,652.98
		222,366.24

RECEIPTS

	D. kr.	D. kr.
I. Contributions		
France	30,000.00	
Great Britain	30,000.00	
Belgium	10,000.00	
Denmark	10,000.00	
Eire	10,000.00	
Finland	7,500.00	
Holland	15,000.00	
Iceland	13,000.00	
Norway	15,000.00	
Poland	10,000.00	
Portugal	15,000.00	
Spain	14,985.00	
Sweden	15,000.00	
		195,485.00
II. Interests		
On Bank Deposits	834.18	
On Investments	5,757.00	
		6,591.18
III. Sale of Publications		4,425.34
Excess of Expenditure over Income to be drawn from the Council's Reserve		15,864.72
		222,366.24

Pension-Fund.

EXPENDITURE	D. kr.
Miss Hansted's Pension as per October 31st	5,000.73
Extraordinary cost-of-living bonus from 1/1 1948—31/10 1949	280.00
Balance as per 31/10 1949	109,777.64
	115,058.37

RECEIPTS	D. kr.
Balance as per November 1st	110,467.48
Interests	4,590.89
	115,058.37

Balance Sheet October 31st 1949.

LIABILITIES	D. kr.	D. kr.
Capital Reserve:		
Balance as per November 1st 1948	120,488.90	
Less Excess of Expenditure over Income	15,864.72	
		104,624.18*)
Pension Fund		109,777.64
Creditors: Contributions for 1949/50 prepaid:		
Sweden	15,000.00	
Poland	10,000.00	
	25,000.00	
Sundry Creditors	25,680.37	
		50,680.37
		265,082.19

ASSETS	D. kr.	D. kr.
Cash at Handelsbanken	10,394.04	
Cash at Sparekassen	2,006.54	
Cash at Postgiro	27.67	
Cash in hand	612.31	
		13,040.56
Danish Treasury Bonds as per Oct. 31st 1949 nominal value 138,000.00 at cost		136,030.99
(Market value on Oct. 31st 1949: Kr. 130,190.00)		
Pension Fund:		
Cash at bankers	2,085.23	
Danish Treasury Bonds as pr. Oct. 31st 1949, nominal 110,000 Kr. at cost	107,692.41	
(Market value on Oct. 31st 1949: Kr. 103,496.00)		109,777.64
Debtors as per Oct. 31st 1949		
Balance of France's Contribution		6,233.00
		265,082.19

*) Capital Account 54,139.18
Special Suspense Account 50,485.00 (increase in contributions)

H. Blegvad

/ E. Brønniche

I have compared the above Balance Sheet with the Books and Vouchers of the Council, and certify that it is in accordance therewith. I have verified the existence of the cash on hand and at bankers as well as of the Treasury Bonds.

Copenhagen, 13. January 1950.

(sign.) Karl Sørensen,
State-Certified Auditor.

Statistique and 11 Plankton Sheets with covers, and, in addition, certain minor expenses, and expenses for translation and distribution. The following publications, which are nearly finished, have been included for payment in this year's budget: *Annales Biologiques* V, *Journal du Conseil* XVI, 2 and the Report of the Scientific Meetings in 1948. There are also in preparation the *Bulletin Hydrographique* and Rapport Atlantique, which have not, however, been taken into consideration. The cost of these will appear in next year's accounts and will involve an expense of nearly 20,000 Kr.

Item VIII includes an extraordinary cost-of-living bonus to members of the staff voted by the Bureau by correspondence in accordance with their decision to follow the rules of the Danish Government.

Income.

The contributions were estimated at a total of Kr. 185,000.00, but since some of the participating countries, at the time of drawing up the budget, had not definitely replied to the request for an increase in contributions, some countries have paid more than estimated and others less. The result is that the total contributions will amount to Kr. 195,485.—. Items II and III: Interests as well as Sale of Publications have been higher than estimated, about 900 and 400 Kr. respectively.

The Pension Fund has decreased from Kr. 110,467.48 to Kr. 109,777.64, as the interests do not cover pension paid to Miss HANSTED, and the balance must be drawn from the bank deposit. One of the treasury bonds of 1,000.— Kr. has been drawn, and no replacement was bought in order to keep sufficient cash in the bank to meet the monthly payments of the pension.

II. Work at the Central Office in Copenhagen.

No changes in the staff or their work have taken place.

Publications.

Rapports et Procès-Verbaux, Vol. No. 122: Reports of the Special Scientific Meetings 1947, released in November 1948; Vol. 123: PAUL M. HANSEN's report on Greenland Cod, released in May 1949; Vol. 124: Procès-Verbaux, Administrative Reports, released in March 1949; Vol. 125: Reports of the Special Scientific Meetings 1948, to be published shortly; Vol. 126: Reports of the Sardine Meeting in Biarritz are being composed by the French printers.

Annales Biologiques, Vol. IV was issued in January 1949; Vol. V, advance copies have been sent to the members of the Consultative Committee and to the authors.

Journal du Conseil, Vol. XV, 3, was distributed in October 1948; Vol. XVI, 1 was distributed in April 1949, Vol. XVI, 2 is in preparation.

Bulletin Statistique, Vol. XXX for 1940—1944 was published in August 1949; Vol. XXXI for 1945—1946 is in preparation.

Bulletin Hydrographique. The 1940—46 issue is still in preparation, the Norwegian observations having not yet been received.

Zooplankton Identification Sheets. The first instalment of 17 sheets with cover was distributed in May 1949. Various material for a second instalment is available in manuscript.

Statistical Department.

Bulletin Statistique 1940—44 was issued in July and distributed in August.

The compiling of the statistics for *Bulletin Statistique* 1945—46 has been continued and most of the material has been received.

At the last meeting of the Statistical Committee it was decided that for Bulletin Statistique 1947 forms should be printed and sent to the different countries to be filled in. These forms were distributed in August.

Mr. G. M. GERHARDSEN, Chief Economist, Fisheries Division of FAO, has sent to the office "Notes on the Improvement of European Fisheries Statistics". Copies of this, with additional remarks by the Chairman of the Statistical Committee, Dr. N. ROSÉN, have been distributed to the members of the Statistical Committee. Later a revised issue of the "Notes on the Improvement of European Fisheries Statistics" was received from Dr. FINN, Director, Fisheries Division of FAO, and this takes Dr. ROSÉN's comments into consideration. Copies were received for distribution and discussion at the Council Meeting in October.

Hydrographical Department.

Bulletin Hydrographique. The preparation of an issue of the *Bulletin Hydrographique* for the years 1940—1946, with an appendix containing unpublished data from the years 1936—1939, has been carried on. The Part of the Bulletin covering the years 1940—1945, as well as the appendix, is ready in second proof. The 1946-part of the Bulletin has not yet been sent to the printers, as observations from one country are still lacking.

The preparation of manuscripts for a 1947- and a 1948-issue of the Bulletin has also been carried on. Observations from several countries are, however, still lacking.

Photostat sheets have been prepared of part of the data received and copies of the sheets have been supplied on request.

Hydrographical Card Index. The data received for printing in the Bulletin Hydrographique have been recorded on index eards. The checking of the card index has been continued and now covers all data north of 45° N. In connection with this checking the card index has been augmented with many data from Atlantic waters. Copies of index cards have been supplied on request.

Working up of hydrographical data.

a) A report "On the Water Exchange between the Norwegian Sea and the North Sea" has been made ready for publication.

b) A report on the rise of sea temperature ("The increase in the Sea Temperature in Northern Waters during recent Years") has been made ready for publication in the Contributions to Special Scientific Meetings, 1948.

c) The calculation of monthly anomalies of the surface temperature in areas of the northern part of

the North Atlantic has been carried on in order to study the variation from year to year of the surface temperature in these waters. For two areas in the north-eastern part of the region the results will be published in Vol. V of the *Annales Biologiques*.

d) Preliminary work has been carried out on the temperature and salinity data from the North Sea for preparation of mean charts for standard depths.

Papers published during the Year.

J. P. Jacobsen (†): Some Characteristic Features in the Variation of Surface Temperature in the North Atlantic. Journ. du Conseil, Vol. XVI, pp. 17—43 (1949).

Jens Smed: Monthly Anomalies of the Surface Temperature in the Sea round Iceland during the Years 1876—1939 and 1945—1947. Ann. Biolog., Vol. IV, pp. 11—26 (1949).

Jens Smed: Monthly Anomalies of the Surface Temperature in Areas of the Northern North Sea. Ibid., Vol. IV, pp. 57—60 (1949).

H. Blegvad.

APPENDIX

Comité Atlantique.

Conférence du Thon.

Malaga: 23—26 Mai 1949 — Tunis: 27—30 Juillet 1949.

Etaient présents à ces Conférences:

Les Délégués et Experts des pays Membres du Conseil International:

Espagne: Contre-Amiral Rodriguez Garcia[1]), Dr. Francisco Navarro[1]), Dr. Luis Lozano, Dr. Miguel Massuti[1]), Dr. José M. Navaz[1]), Dr. Juan Cuesta, Dr. Luis Bellón, Dr. Fernando Lozano, Dr. Emma Bardan de Bellón[1]), Dr. Ricardo Montequi[1]), Dr. Ricardo Menendez[1]).

France: MM. J. le Gall, P. Desbrosses[1]), R. Letaconnoux, E. Postel[1]), Dr. J. Furnestin[1]), Dr. R. Dieuzeide, MM. H. Heldt, J. Ancellin[2]), L. Faure[2]).

Portugal: Prof. Fernando Frade.

Les Observateurs:

Italie: Prof. Massimo Sella[1]).

Etats-Unis d'Amérique: Dr. Lionel Walford[1]).

Recommandations et Vœux.

A. Malaga.

Les Délégués et Experts du Conseil International pour l'Exploration de la Mer, les Observateurs de l'Italie et des Etats-Unis d'Amérique, réunis à Malaga, sur l'invitation du Gouvernement et de l'Institut Océanographique Espagnol, du 23 au 26 Mai 1949, après avoir fait le point des connaissances acquises sur la biologie et les déplacements des principales espèces de Thonidés, puis, établi le programme des recherches à poursuivre dans le cadre international pour compléter ces connaissances dans l'intérêt de la science océanographique et de l'industrie des pêches maritimes,

Considérant qu'un résultat effectif ne saurait être obtenu dans un effort isolé et qu'une collaboration internationale dans la recherche est devenue indispensable pour atteindre rapidement ce résultat;

Recommandent:

1) Que les méthodes et les techniques de recherches biométriques élaborées et adoptées au cours de la Conférence du Thon de Malaga soient appliquées dans tous les laboratoires et institutions pratiquant des recherches sur les Thonidés, de façon à permettre la comparaison et une interprétation uniforme des observations faites et qu'un échange d'informations et de documents soit rapidement établi entre ces différents services ou institutions.

2) Qu'une croisière internationale, à laquelle participeraient les Experts des pays adhérents, soit organisée dans le courant du premier semestre 1950 et consacrée à l'étude des thons et à la recherche des frayères de ces espèces:

a) au large de la côte occidentale d'Afrique: du Cap Spartel aux Iles du Cap Vert, Madère, les Canaries et Açores;

b) en Méditerranée occidentale, pour l'étude du thon rouge, et des concentrations de reproduction de cette espèce.

Que les délégués des différents pays interviennent près de leur Gouvernement respectif et des fédérations professionnelles intéressées pour qu'ils apportent leur contribution financière à l'organisation de cette "Croisière internationale du Thon", dont la durée sera de cinq à six mois environ et les dépenses mensuelles de l'ordre de quatre millions environ.

[1]) Empêché d'assister à la Conférence de Tunis.

[2]) N'a assisté qu'à la Conférence de Tunis.

3) Qu'il soit créé entre les Etats intéressés une "Commission Internationale de Recherches Scientifiques et Techniques sur les Thons", constituée par des représentants qualifiés de chacun des pays signataires, dans le but d'entreprendre des recherches scientifiques et techniques,

— sur la biologie et l'œcologie des différentes espèces de Thonidés;

— sur leur pêche et leur utilisation;

— sur celles des espèces de poissons communément utilisées comme appâts pour leur capture;

— et sur les effets des facteurs naturels et de l'activité de l'homme sur l'abondance des populations de ces poissons et son maintien tel qu'il puisse assurer une utilisation maximum sans crainte de déplétion.

Que les Délégués interviennent près de leur Gouvernement respectif pour connaître leurs dispositions au sujet de la création de cette Commission Internationale et, le cas échéant, y apporter leur adhésion.

4) Les Délégués et Experts réunis à la Conférence du Thon de Malaga manifestent le désir de pouvoir se réunir à nouveau dans un délai de deux mois pour:

a) discuter des rapports particuliers établis par les Rapporteurs désignés au cours de la Conférence, en vue de la préparation du Rapport Général qui sera présenté par M. Henri Heldt, Président du Sous-Comité de la Méditerranée occidentale, à la prochaine assemblée plénière du Conseil International pour l'Exploration de la Mer à Edimbourg, le 3 Octobre 1949;

b) élaborer le programme définitif de la Croisière Internationale du Thon de 1950;

c) examiner et discuter le projet de création de la Commission Internationale du Thon.

Les Délégués et Experts expriment le vœu que cette réunion puisse se tenir à Tunis, vers la fin de Juillet 1949.

5) Constatant l'intérêt apporté à ses travaux par les Etats-Unis d'Amérique, qui y déléguèrent un observateur, la Conférence du Thon de Malaga émet le vœu que la collaboration internationale qui s'y est établie en vue de parfaire les connaissances acquises sur la biologie des Thonidés de l'Atlantique Nord, dans le but de faciliter et de développer leur capture à toute époque de l'année, s'étende aux Etats-Unis d'Amerique et que les recherches entreprises sur ces poissons, dont la distribution est universelle et dont la capture est devenue une ressource essentielle pour l'industrie des pêches maritimes de nombreux pays, fassent l'objet, dans un bref avenir, d'une collaboration mondiale.

B. Tunis.

Les Délégués et Experts du Comité Atlantique du Conseil International pour l'Exploration de la Mer réunis à Tunis du 26 au 30 Juillet 1949 à l'occasion de la Deuxième Conférence du Thon,

a) après avoir fait une mise au point définitive des connaissances acquises sur la biologie des Thonidés;

b) recherché les moyens, les techniques et les méthodes à mettre en application sur le plan international pour résoudre aussi vite que possible les problèmes restant encore obscurs dans la biologie et le comportement des Thonidés;

Recommandent:

1) Que les importants rapports présentés aux Conférences de Malaga et de Tunis fassent l'objet d'une publication sous l'égide du Conseil International pour l'Exploration de la Mer.

Ils suggèrent, à ce propos, que chaque pays publie les rapports de ses Experts dans le format des Publications du Conseil International pour l'Exploration de la Mer et prévoie le tirage d'un certain nombre de "tirés à part" destinés à constituer, par leur assemblage, la publication d'ensemble qui pourra paraître sous couverture du "Rapport Atlantique du Conseil International pour l'Exploration de la Mer".

2) L'organisation, en 1950, de la Croisière Internationale dont le projet a été approuvé à Malaga. La participation financière des Etats et des fédérations professionnelles intéressés sera demandée.

3) L'Organisation de la "Commission Internationale du Thon" dont le principe a été adopté à Malaga et les projets discutés à Tunis.

4) Que les Délégués des Pays représentés rendent compte définitivement de la position de leurs Gouvernements respectifs quant à ces deux projets à la prochaine réunion du Comité à Edimbourg.

5) De mettre au programme de la prochaine "Conférence du Thon" en 1950, les sujets suivants.

(a) La pêche des Thons. Engins et méthodes.

(b) Utilisation rationnelle des produits de la pêche des thons.

Ils manifestent le désir de voir les représentants qualifiés des fédérations professionnelles participer, en cette occasion, à leurs travaux;

Et souhaitent que cette réunion se tienne dans un port thonier de l'Atlantique, en France de préférence.

Reports of Area Committees.

NORTH-EASTERN AREA COMMITTEE

1948

By

GUNNAR ROLLEFSEN

England.

COD otolith collections were continued, but sampling proved inadequate owing to market conditions, and no conclusions of relative brood strengths were reached.

A research vessel intended for use in Arctic waters, the "Ernest Holt", was launched on June 9th and trials were completed towards the end of December.

During the year five members of the scientific staff of the Lowestoft Laboratory visited the Barents Sea grounds in order to bring up to date the 1949 programme of the "Ernest Holt". Four cruises in commercial trawlers were made in the region of Bear Island and Hope Island and, in addition a fifth, hydrological cruise made on a fishery cruiser extended the areas covered by visiting grounds near the Murman coast. Data collected in this cruise have already been the subject of a paper.

France.

Hydrology and Plankton.

En Mer de Barents, à bord d'un chalutier français, 30 prises de températures et prélèvements d'eau ont été effectués en Juillet 1948, de la surface à 200 m.; ainsi que 11 pêches de plancton aux mêmes profondeurs.

Biology.

Cod. En Mer de Barents, en Juillet, 1,000 morues ont été mesurées à bord d'un chalutier français. La maturité sexuelle et les contenus stomacaux des morues ont été examinés.

D'autre part les associations faunistiques (poissons et invertébrés) ont été déterminées à chaque trait de chalut.

Norway.

Hydrography.

See Hydrographical Committee.

Plankton.

See Plankton Committee.

Biology.

Cod. An investigation has been made of the stomach contents of the 0—II-group cod from deep water, caught with a prawn trawl in some fjords in northern Norway in the autumns of 1946, 1947, and 1948. The results from 1946 have been published, and a more detailed report, including all years, is in preparation.

In 1948 the main part of the cod material was collected from the Lofoten and Andenes areas, but samples were also obtained from Bear Island, the Spitzbergen waters, and from the Barents Sea.

From the Lofoten and Andenes areas measurements of approximately 52,000 individuals, age determination of appr. 14,000 individuals and vertebrae counts of about 400 mature cod, together with measurements and vertebrae counts of about 200—400 0-group cod, have been carried out. From the Barents Sea measurements and age determination of nearly 600 cod were taken.

In the Lofoten area some 2,000 cod were marked.

Herring. Routine work has been continued, collecting samples during the winter herring fisheries from the different areas on the west coast of Norway.

On a cruise in the autumn in northern Norway, samples of fat herring were secured.

Haddock. Research work on the stock of haddock has been started. Samples were obtained from various parts of the coast for the determination of sex, age,

growth, and sexual maturity. Vertebrae counts were also carried out.

Other Investigations.

The work on the problems of artificial hatching and breeding has been continued.

In the Lofoten area successful pictures of cod have been taken, at a depth of 60 metres, by means of a submerged 16 mm. movie camera housed in a water-tight casing.

On a cruise with m/c "Johan Hjort" to northern Norway, from September 9th to November 25th, observations were made on the occurrence of the 0-group cod in the littoral region and in the depths of the fjords.

Scotland.

The research vessel "Explorer" carried out hydrographical and plankton sampling over the Norwegian Deeps in June and September, 1948, both visits being extensions of more detailed Northern North Sea surveys. These visits were confined to the Stavanger and Sogne areas respectively. Results will be reviewed in the *Annales Biologiques*.

"Explorer" also took part in the excursions arranged during September in Sogne Fjord for the delegates to the International Council of Geophysics and Geodesy.

List of Publications 1948.

A. Rep. Norw. Fish. and Mar. Invest.

Vol. IX, No. 2, 1948.

Wiborg, K. F.: Experiments with the Clarke-Bumpus Plankton Sampler and with a Plankton Pump in the Lofoten Area in Northern Norway.
No. 3, 1948.

Investigations on Cod Larvae in the Coastal Waters of Northern Norway. Occurrence of cod larvae, and occurrence of food organisms in the stomach contents and in the sea.
No. 4, 1948.

— Some Observations on the food of Cod (*Gadus callarias* L.) of the 0—II-group from Deep Water and the Littoral Zone in Northern Norway and from Deep Water at Spitsbergen.

B. Årsb. vedk. Norges Fiskerier.

Årsberetning 1947 (1949), No. 2.

Koefoed, Einar: Fiskerilitteratur 1947. Tilføyelser for tidligere år.

Årsberetning 1948 (1949), No. 1.

Lofotfisket 1948.

C. Other Publications.

Aasbø, Aslak: Samvirkelag (produksjonslag) blant fiskere i Nord-Norge. Fskdir. småskr. 1948, No. 2 og Fiskets gang 1948, 199.

Bruk av insektmidlet DDT "Kverk" mot makkfluen. Fra Fiskeridirektoratets kjem.-tekn. forskningsinst. Fiskets gang 1948, 259.

Dannevig, Alf.: Gadidae: Transition Area. Ann. Biol. **3**, 93. Kbh. 1948.

— Marketable crustaceans. Transition Area. Ann. Biol. **3**, 104. Kbh. 1948.

— Oysters. Transition Area. Ann. Biol. **3**, 104. Kbh. 1948.

— Rearing Experiments at the Flødevigen Seafish Hatchery 1943—1946. Journ. du Conseil **15**, 277. 1948.

— Spawning and Growth of Young Mackerel on the Norwegian Skagerak Coast. Journ. du Conseil **15**, 218. 1948.

— Vår kysttorsk. Fauna, årg. **1**, 85. 1948.

Dannevig, Gunnar: Merkning av torsk i Lofoten 1947—1948. Foreløbig beretning II. Fsk.dir. småskr. 1948, No. 5 og Fiskets gang 1948, 356, 366, 378, 390.

Forsøksdrift med motortrålere av størrelse 75—100 fot. Fiskets gang 1948, 541, 553, 564.

Grønningsæter, Arne: Beskrivelse av partrål og bruk av redskapet etter de erfaringer en har fått ved Fiskarfagskolen på Aukra. Fiskets gang 1948, 433.

Krav som må stilles til et fiskebruk. Bergen 1948. 6 pp.

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NORTH-WESTERN AREA COMMITTEE

1948

By

Å. Vedel Tåning

During 1948 Denmark, Scotland, and Sweden, had research vessels operating in the area; from Sweden "Skagerak" operated, in late May, in the eastern part of the Faroe-Shetland Channel; from Scotland "Explorer" operated within the area (Faroe waters) from 3rd to 9th May and again in mid-July, and the new research vessel "Scotia" made a short cruise west of Orkney in December; from Denmark "Dana" was within the area from 9th June to 12th August (Faroe, Iceland and East Greenland waters), and the Greenland research cutter "Adolf Jensen" carried out work in West Greenland waters from May to November. In addition, observations were collected by several chartered vessels, fishery inspection vessels, and other governmental vessels, viz., Iceland, in home waters by "Faxaborg" (January), "Bragi" (February—March), "Huginn II" (April—September), Norway, by a chartered motor vessel ("Uran") in Iceland and Greenland waters (June—August), France, by the frigate "Aventure" off West Greenland, England, by the weather ship station "I", and Denmark, by the fishery inspection vessel "Heimdal" in the Davis Strait.

The hydrographic observations will be found in the *Bulletin Hydrographique* and the biological results will in due course be found in national publications, *Annales Biologiques*, and other publications issued by the I. C. E. S.

It was not possible for Eire and Holland to carry out work in the area during the year 1948.

Denmark.

(Å. Vedel Tåning and Paul M. Hansen.)

Faroe Waters.

The hydrographic-biological section between the Butt of Lewis and the Faroe Bank was worked by the "Dana" on 12th to 13th June. Ordinary routine work including trawling, stramin-net towing, plankton collecting etc., was carried out in mid-June (13th—23th June) on the Faroe Bank and around the islands; with special reference to the abundance of pelagic gadoid fry. From 1st to 12th August the "Dana" operated again in Faroe waters, the vessel being engaged in herring research, especially north and north-east of the islands, and samples of spring-spawning large herring were secured by drift-net; in addition the towing of stramin-nets and other routine work (Hensen-net, phytoplankton sampling) was carried out. Water bottles were liberated in several localities. A total of 26 stations were worked.

Some fjord investigations in the Faroes were also made.

The hydrographic-biological section from Nolsø to North Unst was worked during 12th—13th August.

With local assistance about 200 samples of otoliths of large halibut for age-determinations were obtained.

The North Atlantic Ocean and the Denmark Strait.

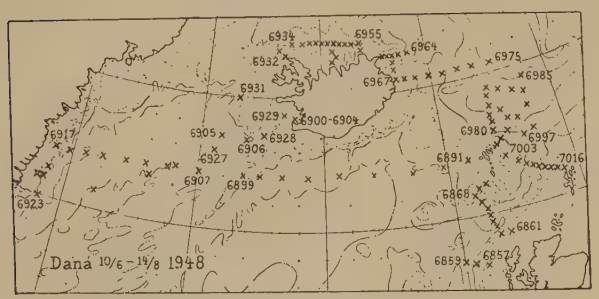
A routine section of hydrographic-biological stations was carried out from the Faroes to East Greenland in the periods 24th—27th June and 15th—18th July (hydrography, plankton investigation, stramin-net towing and pelagic trawling). In the western side of the Denmark Strait hydrography, plankton investgation, and stramin-net towing was carried out as far south as Cape Farewell. Research work in the Davis Strait had to be abandoned owing to a breakdown of the engine. During the investigations in the open Atlantic special attention was paid to probable changes in temperature resulting from the present climatic changes.

Icelandic Waters.

Routine trawling was carried out in Faxa Bay on the territorial and extraterritorial trawling grounds during the days 29th June—1st July, 10 hours trawling being made in each locality. 300 plaice were

marked and liberated in Faxa Bay. In addition, comparative trawling experiments were carried out with the 50′ ottertrawl and the 62 feet plaice trawl.

During the period 23rd to 31st July a general hydrographic and pelagic investigation (stramin-net, Hensen-net, phytoplankton sampling) of the waters off west, north and east Iceland was carried out. A total of 43 stations were worked (see chart) and the research work was especially concentrated on an investigation of the importance of the hydrographic conditions for the occurrence of herring in the waters north and north-east of Iceland.



Sections worked in 1948 by the Danish research vessel "Dana".

Greenland Waters (Paul M. Hansen).

During the winter 1947—1948 the M/K "Adolf Jensen" carried out research work in Godthaab fjord.

From June to the end of September work was carried out in North Greenland waters, especially in Disko Bay and Umanak fjord. In the same months several investigations were made by Mr. J. Nielsen from a motorboat in the Julianehaab district.

Cod. As in previous years cod otoliths were collected at the different fishery stations along the west coast. In addition about 1600 otoliths of small cod were obtained in the Julianehaab district and in Disko Bay. Among the older year-classes those of 1934 and 1936 predominated at several places, but a new year-class, that of 1942, had entered the commercial catches and has been of some importance for the fishery.

A total of 1709 cod were marked, most of them in the Julianehaab district.

Fishing experiments with the eel hand-seine were made in order to investigate the occurrence of small cod of the three youngest age-groups. These small 1—3 year-old cod seemed to occur in greater numbers than in previous years, the I-group especially being present in enormous shoals along the coast, from southern Greenland to Umanak fjord, and some were even caught as far north as the Upernivik district.

The 1945 and 1947 year-classes were the richest of the younger year-classes of cod.

Vertebrae and fin-rays in D_2 were counted in samples of I-group cod from different localities. The results are given in *Annales Biologiques* V for the year 1948.

Greenland-shark. A total of 200 Greenland sharks have been marked in Disko bay and Umanak fjord. The marking discs were fixed in the first dorsal fin, and the total length of the shark was measured before it was released.

Prawns. (*Pandalus borealis*). At Pisigsarfik in the Godthaab fjord trawling experiments were occasionally carried out during the winter of 1947—48 and in the autumn of 1948.

In Disko bay several rich and extensive trawling grounds were found in depths of about 400 m. The average catch per hour's trawling was 125 kg. prawns and the richest catches amounted to 215 and 235 kg. prawns respectively. Samples of prawns were preserved for closer examination.

All fish caught with the prawn trawl were measured and otoliths were secured from several specimens of Norway haddock and Greenland halibut.

Both in shallow water and on the trawling grounds hauls were made with the Sigsbee trawl and bottom dredge for investigation of the benthos.

Hydrographic observations were taken in all areas where biological investigations were made.

England.

(R. S. Wimpenny.)

Fine international net hauls were made throughout the year from 50 metres to the surface at Weather Ship Station "I" (60° N. Lat. 20° W. Long.). (See moreover Plankton Ctee report.)

France.

(P. Desbrosses.)

A naval vessel, the frigate "Aventure", carried out inspection service at Newfoundland and Greenland between 19th April and 11th October 1948; during late July 14 hydrographic stations were worked from the surface to 100 or 200 metres, in localities between Cape Farewell and 70° N. Lat. along the west coast of Greenland; surface temperatures were measured at 30 localities along the route. The observations from these stations made it possible to construct a hydrographic section from 54° N. Lat. to 67° N. Lat. over the fishing banks off Frederikshaab, Fyllas Bank, Little Hellefiske Bank and Great Hellefiske Bank.

Iceland.

(Árni Friðriksson.)

Work at Sea. Throughout January—September 1948, motorboats were commissioned to carry out research work at sea. The boats were "Faxaborg" (Jan.), "Bragi" (Febr.—March) and "Huginn II" (April—September). During the winter and spring the principal object was to trace herring shoals by

means of echosoundings etc. and to locate the herring spawning places from the distribution of young herring larvae in the plankton. Trawling to obtain fish for marking experiments etc. was also carried out, and some bottom samples were taken.

Herring. 6732 herrings were measured and examined for sex, stage of maturity, intestinal fat, and number of vertebrae. Of these fish 4348 came from the north coast, 2000 from the Hvalfjord (Faxa Bay, winter herring) and 384 had been caught by "Dana" north of the Faroes. 3591 north coast herrings were weighed and the age of 6104 herrings was determined, 3847 of which came from the north coast, 1942 from Hvalfjord and 315 from "Dana". 810 stomach analyses were carried out in Siglufjord, and the growth-rate of 1872 Hvalfjord herrings was measured by means of scales. In addition, 7536 herrings were tagged off the north coast (from Skagi to Langanes) by means of internal magnetic tags during the period 3rd to 27th August.

Cod. Investigations were continued as in previous years, the following numbers being measured (number of otoliths in brackets) at different fishing ports: Hornafjord (S.E.) 1310 (504), Westman Isles (S) 2634 (392), Keflavík (Fax.) 3805 (591), Akranes (Fax.) 4188 (1049), Grundarfjord (Br.) 1487, Ísafjord (NW) 1027 (602), Holmavík (Hún.) 103 (103), Dalvík (N) 275 (275), Raufarhöfn (NE) 204 (204) and Reyðarfjord (E) 100 (100)[1]). In addition, 3278 cod were measured and 1398 otoliths collected during work at sea. Thus the total number of cod measured was 18411 and 5679 otoliths were collected.

During the period May 5th to June 18th 1185 cod were tagged in 7 localities.

Marked Cod in Icelandic Waters in 1948.

Position N.	Position W.	Date	Serial numbers of tags	Number marked
63°27′	19°27′	15.5	1351—1570	220
65°02′	14°11′	20.5	1571—1606	36
66°15′	14°40′	25.5	1607—1724	118
66°00′	19°48′	27.5	1725—1800 1851—2429 2451—2487	692
66°04′	22°32′	31.5	2430—2437	8
66°21′	23°17′	31.5	2438—2448	11
64°05′	22°30′	18.6	2501—2600	100
			Total...	1185

Other species of fish. During the motorboat cruises 14031 fish were measured and 4057 otoliths or scales collected from the following species respectively (otoliths or scales in brackets): haddock 3365 (1421), whiting 231 (98), saithe 34 (26), ling 231 (98), halibut 376 (376), plaice 1782 (1166), lemon sole 796 (161), witch 312, dab 2440 (107), long rough dab 2830 (361), 15 other species 1689 (165).

Plankton. 629 stramin-net (S. 200) samples were taken, 641 with Hensen- and 79 with Nansen-nets.

Bottom samples. 89 samples were collected in Hvalfjord and in the vicinity of Reykjavik in order to investigate the possible presence of dead herring on the sea-bottom where the great fishing had taken place during the winters 1946—1947 and 1947—1948.

Hydrography. A total of 1937 temperature measurements were made, and salinity samples were taken all round the coast during the period January—September.

Norway.

(Finn Devold.)

A special cruise to investigate conditions in the North-Western Area started from Tromsø at the beginning of June. Hydrographic sections across to Jan Mayen and from there south to Langanes, Iceland, were worked. Two further sections were run from the coast to positions 60 nautical miles out at sea, crossing the currents off northern Iceland.

Three hydrographic sections were worked off the east coast of Greenland, from coastal waters to positions 60 nautical miles to the east. The investigations were continued on the west coast of Greenland, where hydrographical data were collected on the banks in the Davis Strait as far north as Disko Island. Two sections were operated from the west coast of Greenland to the east coast of Cumberland.

In northern Icelandic waters samples of **herring** were collected in collaboration with Icelandic investigators.

In the Davis Strait samples of **cod** were obtained for age determination, and about 600 cod were marked and liberated.

Plankton samples were collected during the whole cruise.

The expedition returned to Bergen at the beginning of September.

Scotland.

(E. C. Lucas.)

During 1948, the Scottish research vessel "Explorer", operated within the North-Western Area from 3rd to 9th May, when **hydrographical** and **planktonic observations** were made along two lines of stations—(a) Butt of Lewis—Faroe Bank—Syderø, and (b) Nolsø—Flugga. Continuous plankton records were obtained as usual between Scotland and Iceland by the Department of Oceanography, University College, Hull.

Owing to the requirements of the special international hydro-biological programme, the annual trawling survey round the Faroe Islands was, on this occasion, restricted to seven hauls, including one on Faroe Bank. Later, about mid-July, further hydrographic

[1]) SE = south-east coast, S = south coast, Fax. = Faxa Bay, Br. = Breida Bay, NW = north-west coast, Hún. = Huna Bay, N = north coast, NE = north-east coast and E = east coast.

and planktonic observations were made from N. Orkney to 60°15′ N. 6°00′ W. and from the latter position to Cape Wrath.

Measurements and scale samples of **lemon soles** were taken from commercial catches, landed at Aberdeen Fish Market, throughout the entire year. Similar data were collected from Icelandic catches between May and September.

The results of all these investigations are discussed in the *Annales Biologiques*, V.

The newly acquired research ship of the Fisheries Division, Scottish Home Department, (F. R. V. "Scotia", a converted Admiralty vessel) undertook a brief trial cruise in the waters to the west of Orkney in December. She is expected to operate regularly in the area from 1949 onwards.

Sweden.

(A. Molander.)

During late May 1948, investigations on the **ling** were carried out in the area between St. Kilda (Flannan Islands) and the banks north-west of Shetland. Tow-nets were operated to secure eggs and larvae, small ling were caught by trawling and, in addition, samples of ling otoliths were obtained from the catches of fishing vessels operating in the area.

Publications.

"Report of the Sub-Committee on the Faxa Bay" edited by Å. Vedel Tåning. Rapp. et Proc.-Verb. Vol. No. 120, 129 pp. 1948.

COMITÉ ATLANTIQUE

1948

Par

JEAN LE GALL

DANS ce rapport administratif du Comité Atlantique se trouve rapporté brièvement l'ensemble des travaux des trois Sous-Comités constituant le Comité Atlantique:

Sous-Comité du Plateau Continental Européen,
Président: Dr. NAVARRO.
Sous-Comité du Plateau Continental Africain,
Président: Dr. J. FURNESTIN.
Sous-Comité de la Méditerranée Occidentale:
Président: M. HENRI HELDT.

I. Travaux à la Mer.

Hydrologie.

A. Plateau Continental Européen.

Danemark, **Espagne**, **Portugal**: Pas d'observations hydrologiques dans ce secteur du Plateau Continental Européen.

Eire.

Température de surface régulièrement relevée au bateau feu "Coningbeg".

Grande-Bretagne.

a) Angleterre. *Lowestoft* — Observations hydrologiques mentionnées dans le Rapport du Comité Hydrographique.

Plymouth — Observations hydrologiques périodiques en Baie de Plymouth. Continuation des analyses régulières des phosphates et des nitrates.

b) Ecosse. A la fin de 1947, le Département d'Océanographie de l'Université de Hull a étendu ses observations par des pêches continues de plancton entre la côte nord d'Irlande et les deux frégates météorologiques Anglaises. Les résultats ont été résumés dans les *Annales Biologiques*, Tome V.

A la fin de 1948, des immersions de flotteurs dérivants ont été commencées sur ces routes, en liaison avec la division des pêches du Scottish Home Department, qui a procédé aux mêmes opérations à bord de ses navires de recherches.

Les résultats seront interprêtés lorsqu'un nombre suffisant de flotteurs aura été retrouvé.

Le navire "Explorer" a procédé à l'étude hydrologique des eaux de l'ouest et du sud des Hébrides en Février 1948.

Le nouveau navire de recherches "Calanus" du laboratoire maritime de la Scottish Marine Biological Association, à Millport, a été armé à la fin de 1948—1949 et travaillera régulièrement dans son secteur.

France.

Les observations hydrologiques habituelles ont été poursuivies en Manche, en Mer Celtique et dans le Golfe de Gascogne:

— à bord de la corvette "Spahi" sur les pêcheries de maquereaux à l'entrée occidentale de la Manche et à l'entrée sud de la Mer d'Irlande;

— à bord de navires de pêche opérant en Manche, en Mer Celtique, ou dans le Golfe de Gascogne, par le personnel de l'Office Scientifique et Technique des Pêches Maritimes, sur les fonds chalutables du Plateau Continental Celte, et sur les pêcheries de maquereaux, de sardines et de germons;

— la frégate "Aventure" de la Marine Nationale, chargée de la surveillance et de la protection des pêcheries sur les bancs de Terre-Neuve et du Groenland, a poursuivi ses observations hydrologiques habituelles dans ces secteurs;

— le navire océanographique "Président Théodore Tissier" a entrepris une longue croisière du 9 Août au 9 Décembre 1948. Au cours de sa campagne dans le Golfe de Gascogne, en Mer Celtique, en Manche et en Mer du Nord, de nombreuses stations hydrologiques (937) ont été effectuées dans les conditions habituelles. Ces observations ont été complétées par des pêches de plancton, des dragages pour l'étude des sédiments, et par des essais de pêche.

— Les frégates météorologiques basées sur le Point "L". (39° N.—17° L.W. Gr), ont régulièrement poursuivi des observations hydrologiques et les pêches de plancton prévues au programme pendant toute l'année 1949.

B. Plateau Continental Africain.

Espagne.

En Mai et Juin, le navire hydrographique "Malaspina", affecté temporairement à l'Institut Océanographique, a poursuivi l'exploration de la côte du Sahara Espagnol, du Cap Bojador à la Pointe Durnford (26°10′ N. à 23°30′ N.) en vue de l'établissement de la carte de pêche.

France.

En collaboration avec les avisos de la Marine Nationale le Service Scientifique des Pêches du Maroc a établi sur la côte du Maroc une série de sections hydrologiques parallèles qui ont été régulièrement étudiées.

Maroc.

Quatre séries trimestrielles d'observations (température et salinité) ont été effectuées avec les escorteurs "Ruse" et "Voltigeur" entre les Détroits de Gibraltar et des Canaries (profondeur de 5, 25, 50, 100, 200 m. le long de 15 lignes perpendiculaires à la côte).

C. Méditerranée Occidentale.

Espagne.

Le "Xauen" a fait quatre croisières en Janvier, Février, Juillet et Août—Septembre en Mer d'Alboran et dans la partie orientale Détroit de Gibraltar.

Les observations hydrologiques habituelles ont été complétées par des pêches de plancton en surface et en profondeur, des dragages et des pêches de chalut.

La bathymétrie minutieuse d'un secteur de la côte du Maroc a été effectuée. Un banc dénommé "Banc Xauen" a été découvert par 35°20′ N. et 4°15′ W.

France.

Plusieurs sorties avec observations hydrologiques ont été effectuées au laboratoire Arago à Banyuls s/Mer.

Diverses observations ont été faites dans les étangs côtiers de la Méditerranée.

Le bateau de recherches "Eider" du Musée Océanographique de Monaco a fait 55 prises d'eau et de température au cours de 50 sorties en 1948. Des pêches planctoniques (13), 113 pêches au chalut ont été également effectuées.

Tunisie.

Des sorties ont été effectuées à bord des vedettes de la surveillance des côtes, des chalutiers d'Etat et des bateaux de pêche tant sur la côte nord que sur la côte orientale; la région de Sfax et le Golfe de Gabès jusqu'à Djerba.

L'escorteur de la Marine "Le Volontaire" a été équipé pour les recherches hydrologiques et a effectué une série de stations (température — échantillons d'eau — plancton) où les observations seront régulièrement poursuivies par la suite.

Des prélèvements périodiques ont été opérés dans les lacs littoraux.

II. Plankton.

En Espagne, en France, au Maroc, en Tunisie et au Musée Océanographique de Monaco, les pêches de plancton signalées dans le chapitre précédent ont été examinées dans les services spécialisés.

III. Sédiments Marins.

L'étude de ces dépôts a fait l'objet d'études très poussées de la part des spécialistes Espagnols et Français.

Au Maroc prélèvements réguliers de sédiments dans toute la zone côtière atlantique.

IV. Cartes de Pêche.

Sont actuellement à l'étude ou sous presse les cartes des fonds de pêche:

a) de la Manche et du Plateau Continental Celte (France);

b) des côtes du Maroc, de Mauritanie et du Sénégal (France);

c) de la côte de Mauritanie du Cap Juby au Cap Bojador et du Cap Bojador à la pointe Durnford (Espagne — sous presse).

Le "Xauen" a commencé en 1948 le levé d'une carte de pêche du Maroc Méditerranéen.

d) Cartes de pêche: publication, par le "Grémio" des Armateurs de la pêche au chalut de "Roteiro da Pesca de Arrasto da Costa Continental Portuguesa"[1]).

Des cartes des lieux de pêche au chalut sur les plateaux continentaux Européens et Africains sont en préparation en France et en Espagne.

Des cartes mensuelles des lieux de pêche du maquereau, de la sardine, et du germon sont à l'étude à l'Office Scientifique et Technique des Pêches Maritimes en France.

V. Biologie.

A. Clupéidés.

a) **Hareng** (*Clupea harengus* L.).

Investigations sur le hareng de la côte d'Irlande (Eire).

b) **Autres Clupéidés.**

Les rapports présentées à la Conférence Internationale de la Sardine qui s'est tenue à Biarritz du 26 au 30 Avril 1948 ont fait l'objet d'une publication spéciale dans les éditions du Conseil[2]).

Depuis cette réunion, les recherches sur la sardine, (*Clupea = Sardina pilchardus* Walb.), la sardinelle

[1]) Par J. G. Boavida, 1 vol., Lisbonne 285 pp., avec nombreuses figures et cartes de pêche.

[2]) Rapp. et Proc.-Verb. Vol. No. 126. — Rapport Atlantique 1948.

(*Sardinella aurita*) et (*Sardinella oba*), le sprat (*Clupea sprattus* L.) et l'anchois (*Engraulis encrasicholus*) ont été régulièrement poursuivies en Mer d'Irlande (Eire—sprat), dans le Golfe de Gascogne (France), sur la côte nord d'Espagne (Espagne), au Maroc et en Méditerranée (France et Espagne); sur les côtes du Portugal (Portugal): Examen d'échantillons, assez nombreux, au point de vue de taille, sexe et conditions des gonades, nombre et moyenne des vertèbres, écailles (âge et croissance) et contenu de l'estomac (plancton).

Plusieurs rapports ont été publiés sur ce sujet.

En Juin et à la fin de l'été, le drifter à moteur "Onaway" du laboratoire de Lowestoft (England) a fait des recherches sur le stock de sardines de la côte SW. d'Angleterre. L'importance du sondage par écho et de la senne tournante (ring net) a été définitivement démontrée dans les eaux de Cornouailles.

B. Scombridés.

Continuation des recherches sur les concentrations de ponte du **Maquereau** en Mer Celtique (France) et sur les côtes du Maroc (*Scomber colias*).

C. Carangidés.

L'étude du **Chinchard** (*Trachurus trachurus* L.) a été poursuivie à Vigo (M. Lozano). Des données des variations de la composition chimique de cette espèce ont été établies par M. Arevalo.

Le travail de M. Letaconnoux sur ce poisson est en cours d'impression.

D. Gadidés.

a) **Merlu** (*Merlucius merluccius* L.).

M. Letaconnoux a résumé les résultats de ces observations sur le merlu dans les *Annales Biologiques* Vol. IV, 1948.

M. Maurin a entrepris l'étude du merlu des côtes Marocaines.

Pendant l'année 1948 des mensurations ont porté sur 3,1814 merlus à Fleetwood, sur 57,169 à Milford.

b) **Merlan** (*Gadus merlangus* L.).

La deuxième partie du travail de M. Desbrosses sur le merlan paraîtra dans la *Revue des Travaux de l'Office des Pêches* (Vol. 14 à l'impression).

c) **Morue et Tacaud** (*Gadus morrhua* L. et *G. luscus* L.).

Les observations biologiques et hydrologiques faites sur la morue sur les bancs de Terre-Neuve et du Groënland sont à l'étude. Le tacaud a fait l'objet d'une publication de M. Oliver (Vigo).

E. Espèces Diverses.

M. Coupe poursuit l'étude des **Sparidés** de la côte du Maroc.

La station océanographique de Salammbô a fait paraître une note sur la biologie des **Daurades** et des **Muges.**

F. Algues Marines.

M. Dizerbo (France) continue l'exploration des champs de **Laminaires** sur les côtes de France.

Mlles De Val et Garcia (Espagne) ont suivi méthodiquement les variations de la constitution chimique des algues marines industrielles.

G. Divers.

Des recherches expérimentales sur la corrosion des métaux par l'eau de mer et la fixation des organismes marins ont été entreprises au laboratoire de Vigo (Espagne) par MM. Anadon et Arevalo.

Une étude systématique des conditions hydrologiques et biologiques dans les étangs du littoral Méditerranéen Français, situés en bordure du Golfe du Lion, est entreprise depuis 1941 par le Laboratoire pour l'étude biologique de la Camargue et des Etangs Méditerranéens (Rapport de M. Petit).

NORTHERN NORTH SEA COMMITTEE

1948

By

C. E. Lucas

A number of difficulties, varying from country to country, still persist, particularly in obtaining precision apparatus, whilst few countries have research ships available for operations all the year round. Yet there has been undoubtedly a marked decrease in such difficulties, as is shown by the extended scope of the work which some countries have been able to undertake. At the same time, there are improvements in the fishing industries of the countries, so that the combined fishing power in the area is increasing, with its inevitable effects on the commercial fish stocks.

Reports.

The following reports have been received from the representatives of the countries concerned:—

Denmark (Å. V. Tåning).

In the beginning of June and August trawling experiments were made at some scattered stations and hydrographical and other routine observations were made.

On the slopes west of Orkney and the Hebrides experimental fishing, *inter alia* for Porbeagle shark, was carried out early in June.

In addition, two hydro-biological sections over the Faroe-Shetland Channel were completed on 12th to 13th June and 12th to 13th August. The pelagic work at several stations was designed to investigate the influx with Atlantic water of eel larvae which were present in August in considerable numbers.

England (R. S. Wimpenny).

No observations were taken in the Northern North Sea by English Research Vessels in 1948. Some dry weight observations on Hensen net samples were collected on England's behalf by the Danish Research Ship "Dana", in the international cruises which took place in May. These results will be published as soon as the relevant hydrographic data is available.

France (P. Desbrosses).

Le navire de recherches "Président Théodore Tissier" a effectué une douzaine de stations et de pêches planctoniques comprenant une coupe hydrologique le long du 58° L. N. depuis "Fladen Ground" jusqu'au Skagerak; du 28 Septembre au 1er Octobre 1948.

Neuf stations hydrologiques avec pêches de plancton ont été faites du 7 au 19 Juillet par l'aviso "Ailette" de la Marine Nationale.

Holland (B. Havinga).

Data were collected on the catch of Dutch herring drift-net luggers in regard to locality, time and size of catch and the quality of the herring (matjes, full or spawned). The data will be published in the form of charts, see *Ann. Biol.*, Vol. V, 1948, pp. 76, 77.

Norway (F. Devold).

Hydrography.

The programme decided at the special meeting in Göteborg was carried out according to plans.

During the herring fisheries in January/March hydrographical sections were taken.

Investigations in the fjords of western Norway and in the waters off the coast were carried out in connection with the sprat fisheries in May/July.

Plankton.

Plankton was collected on the cruises in the Northern North Sea when carrying out the programme decided at Göteborg. Unfortunately most of the material collected was washed overboard and lost.

Samples of eggs and larvae were gathered in connection with sprat investigations.

The Fish.

Herring. Routine work collecting samples for determination of age, growth, weight, fat content, maturity, and development was undertaken.

Marking experiments were carried out by Mr. Olav Aasen in collaboration with Mr. Árni Friðriksson from Iceland. A little more than 6,000 herrings were marked using the American method. Magnetic apparatus have been installed in several herring factories for detection of the marks. An Asdic cruise following the herring shoals when approaching the coast in January was planned, and for this purpose a ship from the Royal Norwegian Navy had been hired. Unfortunately the ship ran ashore and was damaged to such a degree that the cruise had to be cancelled. After the repair of the ship the cruise could be continued early in March when we hoped to be able to detect the shoals leaving the spawning grounds. This, however, proved impossible as the spawning this year took place close to the shore.

Sprat. Sprat investigations were carried out in the fjords of western Norway, collecting samples for age and growth determination. The investigations were also extended to our southern coast and the Skagerak.

Haddock. Material for determination of age and growth was procured.

Mackerel. Samples of mackerel were collected for age and growth determination.

Poland (W. Cieglewicz).

Research work during 1948 was carried out in the Baltic Sea only.

Scotland.

The scope of the surveys conducted by the Scottish Home Department's Marine Laboratory at Aberdeen was increased during the year: first by the acquisition during the spring of a 75 ft. motor fishing vessel, "Clupea", for herring work, and then by the 164 ft. steam vessel "Scotia", in December, for hydrographical and biological investigations.

During 1948 this has meant that, in addition to the more or less routine cruises of the "Explorer" in deeper waters, and "Kathleen" along the inshore waters, it has been possible to initiate a special programme of herring research within the Scottish east coast fishery. The introduction of "Scotia" will probably allow some extension of work within this area, although it is expected that she will chiefly be occupied in more oceanic waters.

The routine cruises of "Explorer" covered the greater part of the North and Central North Sea, whilst the Faroe-Shetland area was investigated in May (in the course of the special international hydrobiological survey), and the waters to the south of it in July. The chief objects in these cruises were the state of the stocks of haddock, lemon sole, whiting, etc., together with the relevant hydrographic and plankton surveys. In addition, "Explorer" also took part in the special international survey of September (this time in the North Sea).

In association, the Department of Oceanography, University College, Hull, continued to develop its series of monthly plankton records in this area, from its laboraty at Leith.

Sweden (A. R. Molander).

Work during 1948 included (1) hydrographic cruise (1—14 May); (2) trawling experiments for ling off Shetland (end of May); and (3) working up of statistical material of haddock from the North Sea.

General.

No publications during the year under review (other than those in the Council's series) have been reported.

It is hoped that the series of monthly herring charts for the North Sea and adjacent waters will be published during the course of the year, and it is understood that a number of reports are in preparation, some for early publication.

SOUTHERN NORTH SEA COMMITTEE

1948

By

R. S. Wimpenny

The work of members of the Southern North Sea Committee in 1948 was able to proceed generally along the lines laid down in the programme outlined at the meeting held in October 1947. Facilities for investigations both ashore and afloat remained a difficulty for some member countries, but the prospects in this direction looked more hopeful by the end of the year. Further signs of a return to the over exploited conditions obtaining before the war were evident in at least one of the more important demersal fish stocks and until a more effective measure of internationally agreed control of fishing is obtained, members of the committee cannot expect to avoid seeing a return to the pre-war conditions.

Work at Sea.

Belgium.

The fisheries cruiser "Bregdel" took salinity and temperature observations as well as plankton samples at station B 22 off Nieuport and at stations B 13, 14, 15, and 16 on the line Gravelines-Deal during June and July, after which the ship was laid up.

Denmark.

The "Dana" operated in the southern North Sea from May 5th to June 5th and again from August 13th—18th. During the first part of May the vessel co-operated with the research vessels from England, Holland, Norway, Scotland and Sweden in the general North Sea survey. The Danish sections of this survey were partly repeated in late September by the "F. V. Mortensen". Plaice investigations were made in the central part of the North Sea, especially in the Dogger Bank area, special emphasis being laid upon marking experiments. Routine trawling, stramin net towing, phytoplankton sampling and bottom sampling, were also carried out at fixed stations. Comparative fishing of the 50′ otter trawl and a 62′ plaice trawl was also undertaken. The Waddensea plaice trawl was operated from a motor boat between June 11th and 22nd, September 1st and 9th, and October 22nd to 30th. In September the work was done between Ho Bay and Sild and on the other two occasions in the northern area of the Waddensea.

England.

Two motor vessels, the "Onaway" and "Platessa" and one steam trawler the "Sir Lancelot" worked throughout the year in the North Sea and Channel making 21, 30, and 26 voyages respectively.

In addition to carrying out the routine Flamborough Line observations and taking part in the international survey in May, the "Sir Lancelot" undertook twelve cruises in connection with herring, plankton, and echo-sounding, seven in the East Anglian fishery ground in the autumn and the rest in the spring and early summer, mainly off the English north-east coast. Other cruises included five at the beginning of the year to conduct a census of plaice eggs in the Southern Bight, three devoted to plaice marking and mesh selection and two on comparative fishing.

The "Platessa"s work was almost equally divided between co-operation with the "Sir Lancelot" in the East Anglian herring fishery survey, plaice population surveys, plaice marking, mesh experiments and comparative fishing tests.

In the first two months of the year the "Onaway" was engaged in a sprat and herring investigation off the SE. coast of England and the NE. coast of France. In May this ship was used in an investigation of herring off the NE. coast of England, in June and July the spawning grounds of the pilchard in the East Channel and in the autumn and winter she carried out ring net and echo-sounding investigations in the East Anglian herring fishery.

The "Clupea"—a 75′ motor drifter, shared with Scotland—joined in the English programme from August 22nd and was chiefly occupied in echo-sounding and drift-net fishing for herring on the Yorkshire coast and East Anglian fisheries in the late summer and autumn.

Holland.

A commercial Texel cutter was used in a comparative fishing experiment with the English research vessel "Platessa". Three cruises were made in the western part of the Dutch Waddensea in July, September and November using a shrimp trawl in order to investigate the density of young plaice and of young Pleuronectidae in general. In April investigations had to be interrupted owing to damage to the net in the first haul. In order to obtain internationally comparable results, a comparison will be made between the shrimp-trawl used and the Danish young-plaice trawl as soon as the latter is obtained. Although Holland participated in the international hydrographical cruises in September, the new Dutch research ship for the North Sea investigations was not ready until the end of the year.

Norway
Poland
Sweden } No sea work carried out in the Committee's area in 1948.

Scotland.

During routine cruises in the middle North Sea in May, and October, the "Explorer" proceeded eastwards as far as the Fisher Bank and crossed into the southern North Sea as far as the north edge of the Dogger Bank. The trawl was used on several occasions and observations were made on the plankton and hydrographic conditions.

Work on the Fish Species.

General.

Much progress in an important direction has been made by Holland, where statistics were obtained in respect of the different species for the various statistical rectangles of the North Sea. From these data monthly figures have been calculated giving interesting indications of the trends of the stocks of cod, haddock, plaice and sole. Measurements, otoliths and scales were usually secured for brill, turbot, lemon sole, dabs and gurnards taken in the trawl catches of the "Dana" as well as the material mentioned for the species below.

Cod.

On the market at North Shields 22,012 and at Grimsby 12,612 cod were measured. At Esbjerg market 369 samples of otoliths of large cod were taken. Samples of otoliths and measurements were also obtained from the trawl catches of the "Dana" cruises.

Haddock.

Market measurements of 7,940 haddock were made on Grimsby market in support of the Scottish investigations on this fish.

Whiting.

All whiting caught in the trawl hauls of the "Dana" were measured and a certain amount of material was collected for age determination.

Plaice.

A census of plaice eggs was carried out on the main spawning ground in the Southern Bight in the early part of the year by one of the English research vessels. This revealed an estimated egg production of five million millions—a figure similar to that found in 1947.

In connection with the study of the 0-group plaice the Danish investigations included 54 young-plaice trawl and temperature observations made in the Danish Waddensea in June, September and October. The 0-group was present in lower numbers than in any year from 1933 to 1947. An examination of the food of 0—III plaice from this district was continued. Fifteen hauls with a shrimp trawl in July, September and November were made by Dutch investigators with a view to obtaining information on the density and age-composition of the young plaice of the Dutch Waddensea. The reading of otoliths from these samples proved to be difficult and the structure of the otolith of the I-group has been made the subject of a special study. The general investigation of otoliths mentioned last year has been continued by Holland.

Over 130,000 plaice were measured at English ports during the year, the figures being distributed as follows:—

North Shields	4,949
Grimsby	50,546
Lowestoft	62,806
Rye and Hastings	12,916

Of these, more than 13,000 were examined for weight, sex and age. Market observations were also made at Esbjerg in March, May, June, August and October, a total of 17,000 being measured and otolith samples taken from 2,200 specimens. Otolith samples were also obtained during the trawling operations of the "Dana".

The Danish marking experiments were continued in the central North Sea, a total of 1,543 plaice, mainly between 30 and 50 cm. being liberated. The percentage re-caught in the area during the first half year in the years 1946, 1947 and 1948 was found to have increased from 29·5 to 31·5 and 36·0 respectively. 13,069 plaice were also liberated as a result of English marking experiments carried out in the southern North Sea, mainly on the Haddock Bank, the Botney ground and the Oyster ground. Of these 2,834 or 22% were returned in the first six months.

Sole.

Scale samples of this species have been collected by Dutch investigators but considerable difficulties have been met with in ascertaining the age by this

method. Market measurements made on Lowestoft fish market numbered 4,863—a considerable reduction on the previous year and corresponding broadly to the decreased landings of this species.

Turbot and Brill.

A preliminary investigation into the age-length relation of these species was commenced in England.

Herring.

English investigations off the NE. coast of England in the spring failed to find traces of brood attributable to a southward displacement of the Firth of Forth spawning. An examination of the Northumbrian and Yorkshire shoals was started in August and September.

The age-composition of the East Anglian herring shoals was in accordance with the published forecast, but the main October "glut" period was later than expected. More herring of the East Anglian type appeared in these shoals than in other post-war seasons. In order to identify the components of the East Anglian herring fishery and to prepare the forecast for the following year over 186,000 herring were measured at Lowestoft and Yarmouth and the scales of 4,200 were examined at the Lowestoft laboratory.

Observations on the length, age, sexual maturity and vertebral number of the winter spawning and spent herring shoals of the NE. coast of France were made as a result of the continuance of the French programme of investigations. Belgian investigations into the spent herring shoals found off the Belgian coast from January to March continued as in previous years. The total catch and density were substantially lower than in the previous year. 1,050 individuals were examined for age, sex, maturity, mesenteric fat, keeled scales, stomach contents, weight and length.

Sprat.

Echo-sounding investigations made by an English ship revealed unfished concentrations suitable for ring-netting off the SE. coast and in several places between the English and French coasts. Samples of sprats were taken by Danish investigators in December off the west coast of Jutland when fishing for a fish-meal plant.

Rational Fishing.

Studies involving reproduction, recruitment, growth and maturity and fishing mortalities for the plaice were continued in England. A resultant exploitation equation has allowed quantitative assessment of the effect of limiting fishing intensity, limiting catch and of mesh regulation. It has been deduced that changes in mesh size and fishing intensity should be considered together to obtain maximum efficiency. It has also been found that, in respect of plaice recruitment the size range over which migration to the main fishing grounds takes place is above the selection range of the mesh now used.

Comparative fishing tests comparing two British trawlers, two British trawlers and a seiner and a British trawler with a Dutch cutter, were also carried out.

Aids to Fishing.

Echo-sounding.

During the English pelagic work, much use was made of echo-sounding both as an aid to capture and for charting distribution. Experience gained with the instrument was sufficient to permit the identification of herring, pilchard, sprat and mackerel by the special character of their traces.

Publications.

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Boerema, L. K. and Ros, W.: "The Dutch Fishery for Demersal Seafish in 1946." Annales Biologiques. Vol. III. 1948.

Cattley, J. G.: "Sex Reversal in Copepods." Nature **161**, p. 937. 1948.

Gilis, C.: "Concentration de Harengs Guais sur la côte Belge au cours de l'Hiver." 1943—46.

Graham, M. G. "Rational Fishing of the Cod in the North Sea." Buckland Lectures for 1939. Edward Arnold, London. 1948.

Hodgson, W. C.: "The East Anglian Herring Fishery 1946." Annales Biologiques Vol. III. 1948.

Jensen, A. J. C.: "The Plaice in the open North Sea." Annales Biologiques. Vol. III. 1948.

TRANSITION AREA COMMITTEE

1948

By

ERIK M. POULSEN

Denmark.

(AAGE J. C. JENSEN and ERIK M. POULSEN.)

Hydrography.

Observations of temperature and salinity were made during the experimental fishery.

Plankton.

Samples of plankton were taken with the Hensen net in various waters. Samples of macroplankton, especially fish egg and fish larvae, were taken weekly from the light-vessels Anholt Knob, Schultz' Grund and Halsskov Rev.

Benthonic Food.

Valuations of the sea bottom were carried out with the Petersen bottom sampler in the Limfjord and with the van Veen bottom sampler in the Isefjord.

Fish.

Eggs and Larvae. Fishing experiments with the ring-trawl were carried out in June in the Skagerak and in the Baltic east of Møen from the S/S "Biologen" and from the M/B "Havkatten".

Flat Fish. The density of 0-Gr. plaice, flounder, turbot and brill was investigated in July, August and September by hauls with the Johansen young-plaice trawl along the coasts of the Skagerak, Kattegat, Belt Sea, the Sound and Western Baltic.

The stock of older flat fish was examined by means of hauls with the eel-tog in the Limfjord and in some parts of the Belt Sea, and with the eel-trawl in the Isefjord.

Market measurements and age investigations of commercially caught plaice were made at several fishing ports.

Transplantations of young plaice were carried out in April, 1·2 millions of young plaice being transplanted from the westernmost part of the Limfjord to the central parts of the fjord, and 0·6 million from the same area to the Belt Sea and adjacent waters. Analyses of age, length, and race of samples of transplanted plaice were carried out.

Samples of commercially caught plaice from parts of the Belt Sea were examined in order to investigate the result of the transplantation.

Other Demersal Fish. The density of 0-group flounder, brill and turbot was investigated during the coastal fishery for young plaice. The stock density and the length and age-distribution of the various species was investigated with the eel-tog and the eel-trawl.

Herring. Commercial catches from various waters were analysed for length, age, maturity and racial characters.

Sprat. Commercial catches were examined for racial characters.

Waste Fish. Analyses of catches were undertaken in order to ascertain the abundance of the young of commercial fishes in the catches.

Predictions of the yields of the mackerel and silver-eel fisheries were given.

Deep Sea Prawns. Fishing experiments with the deep-sea-prawn trawl were carried out in the Skagerak during the summer months.

Publications.

BLEGVAD, H.: "Beretning om Fiskeriundersøgelserne i Farvandene omkring Danmark i 1948." Dansk Fiskeritidende 30. April 1948 et seq. Vestjysk Fiskeritidende 10. April 1948 et seq.

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— "Udsigterne for Drivgarnsfiskeriet efter Makrel etc." Dansk Fiskeritidende 14. Maj 1948.

— "Udsigterne for Blankaalfiskeriet." Dansk Fiskeritidende 10. Sept. 1948. Vestjysk Fiskeritidende 10. Sept. 1948.

POULSEN, ERIK M.: "Vodfiskeri efter Silding og Brisling i Limfjorden." Biol. Stat. Beretning XLIX, 1948.

Norway.

(Alf Dannevig.)

Hydrography.

Observations on the temperature and salinity of the sea water were taken every working day at Flødevigen at 0, 1 and 15 metres below the surface.

In the neighbouring parts of the Skagerak and in the Oslofjord 103 hydrographic stations were worked.

Biology.

Fish Eggs and Larvae. Material was collected at 25 stations. 100 hauls were made with the egg-net, and 50 using the larvae-net. The material is now being worked up.

Gadidae. The 0-group. Experimental fishing with a shore-seine in the littoral region has been carried out according to the pre-war scheme, 79 hauls having been made on the Skagerak coast and 61 in the Oslofjord.

Older fishes. Experimental fishing with traps has been carried on at Flødevigen.

Herring. Samples of herring from different parts of the Skagerak coast have been examined.

Lobsters. Statistics from individual fishermen have been collected according to the pre-war scheme.

The Hatchery.

The hatching of **cod fry** was continued on a small scale, it being difficult to obtain a sufficient number of spawners. The rearing of **lobster** larvae was successful.

A limited spawning of **oysters** took place early in summer, and some spat resulted. A heavy spawning late in summer gave no spat.

Experimental Rearing of Fish Larvae. The rearing of *Pleuronectes platessa* in the laboratory was very successful, as it was with the larvae of *Gadus callarias* till an age of approximately 4 weeks after hatching.

Publications.

Pedersen, Elisabeth: "Østersens respirasjon. Undersøkelser utført ved Statens Utklekningsanstalt Flødevigen." Bergen 1947.

— "Bestemmelse av kalsium i sjøvann. Undersøkelser utført ved Statens Utklekningsanstalt Flødevigen." Bergen 1947.

Dannevig, Alf: "The Number of Vertebrae and Rays of the second dorsal Fin of Fishes from the Norwegian Skagerak Coast." Ann. Biol. Vol. II. 1947.

— "Spawning and Growth of Young Mackerel on the Norwegian Skagerak Coast." Journ. du Cons., Vol. XV. No. 3.

— "Rearing Experiments at the Flødevigen Seafish Hatchery 1943—1946." Journ. du Cons., Vol. XV, No. 3.

— "Vår kysttorsk." Fauna No. 3 og 4/1948. Oslo 1948.

Sweden.

(Arvid R. Molander.)

Hydrography.

Special investigations concerning the hydrography of the Gullmar fjord were carried out. Hydrographic investigations consisting of sections across the Skagerak and the Kattegat were made in connection with the study of the occurrence of the herring off the Swedish west coast.

Biology.

Sprat. The investigations on the sprat were continued by means of sampling from the fjords of the Swedish west coast and by collecting information relating to the daily landings at various ports on that coast.

Herring. The investigations on age-classes, types, and migrations were continued. A research into the diurnal feeding habits of the young of the herring was completed.

Haddock. The variations in the stock in the Skagerak and the northernmost Kattegat were investigated by fishing experiments with the trawl and by collection of statistical data from the fishing port of Göteborg.

Whiting. Investigations concerning the whiting along the Swedish west coast were begun.

Flounder. The year-classes and the growth were studied by fishing experiments in the southern Baltic.

Witch. The alterations of the stock in the Skagerak were examined by means of fishing experiments with the trawl and by collecting statistics from the fishing port of Göteborg.

Plaice. The year-classes and the growth were examined in the southern Baltic by means of fishing experiments with various gear. The variations of the stock in the Skagerak and the Kattegat were studied partly with the help of fishing experiments with the trawl and partly from collections of statistical data from the port of Göteborg.

The youngest age-groups of plaice, flounder, and turbot. The investigations on the abundance of the youngest age-groups of these three species were continued along the west and southern coasts of Sweden.

Norway lobster. The investigations concerning the biology of this species were continued.

Size of Mesh.

Fishing experiments with trawls of various mesh sizes were carried out.

Publications.

Molander, Arvid R.: "The Swedish Witch Fishery in the Skagerak and the North Sea." Rapp. et Proc.-Verb., Vol. No. 122, 1948.

BALTIC AREA COMMITTEE

1948

By

Chr. Hessle

Reports of work carried out during the year 1948 have been received from Denmark, Finland, Poland and Sweden.

Denmark.

Hydrography and Plankton.

Investigations of hydrography and plankton off the coast of Bornholm were carried out from M/B "Havkatten" during September.

Biology (Aage J. C. Jensen).

Flat Fish. The abundance of 0-group plaice, flounder and turbot was determined by quantitative fishing experiments with the Johansen young-plaice trawl from the M/B "Havkatten" on the coasts of Seeland, Møen and Falster from 30th June and 22nd September, and at Bornholm from 6th to 12th September. At Bornholm quantitative hauls with the hand shovenet were also carried out.

Herring. Samples of herring from Møen and Bornholm have been analysed for race, age etc.

Sprat. The spawning of sprat was investigated from M/B "Havkatten" from 27th June to 1st July.

Eel. A disease of the eel was investigated at the laboratory, and bottom material from the Swedish coast near Trelleborg, where the disease has been particularly frequent, was investigated from M/B "Havkatten" in November.

Finland.

Biology (T. H. Järvi).

Herring. Samples of herring from the Finnish Bay and from some localities in the Gulf of Bothnia have been analysed for age and growth.

Seals. Statistics of killed seals have been collected.

Poland.

Hydrography.

The Meteorological-Hydrographical Institute at Gdynia carried out the following observations:

1) daily observations of the surface temperature and salinity at 3 coastal stations (Gdynia, Ustka, Kołobrzeg).

2) daily variations of the sea level at 20 localities.

The Marine Station at Gdynia has made monthly observations at 6 stations at every 10 metres of depth, on the temperature, salinity, O_2- and P content simultaneously with the collecting of plankton samples.

Cruises.

Two cruises with the M/S "Zodiak" were made in July and November for plankton and hydrographic investigations between Bornholm and the Gulf of Gdánsk.

From December the research vessel "M. Siedlecki" was used for cod investigations.

Plankton.

Comparative studies on the composition of zoo- and phytoplankton in the Bornholm Basin and the Gulf of Gdánsk were carried out at 6 fixed stations.

Biology (M. Bogucki).

Cod. Studies on the migration of cod by means of tagging experiments were begun. Recaptures amounting to 2% were obtained.

Investigations on the age-composition of the stock, and its maturity and length, were continued.

Market measurements of cod landed in Gdynia were carried out.

Flat Fish. In order to determine the relative strength of the year-classes fishing experiments with

hand push-nets have been made at 5 stations during September.

Herring. Samples from different fishing grounds were collected and analysed for age, race, and spawning periods.

Sprat. Some increase of the stock of sprat was observed on the Polish coast, but the quantity of fish caught was still very small.

Publications.

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Bogucki, M.: "On the reproduction of *Mesidotea entomon* in the Baltic." Bull. Lab. Mar. Gdynia, No. 4. 1948.

Cieglewicz, W.: "The migration and the growth of the marked flounder from the Gulf of Gdánsk and the Bornholm Basin." Arch. Hydrobiol. et Ichthyol., Vol. XIII. 1947.

Cieglewicz, W. and Mulicki, Z.: "Size and age composition of commercial catches of the flounder in the Gulf of Gdánsk and near Liepaja." Bull. Lab. Mar. Gdynia, No. 4, 1948.

Dixon, B. and Mulicki, Z.: "Sprat investigations on the Middle Baltic during the Summer 1938." Ibid.

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Mańkowski, W.: "Feeding and Food of the sprat in the Middle Baltic." Arch. Hydrobiol. et Ichthyol., Vol. XIII, 1947.

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— "Comparative studies as to the quantitative distribution of eggs and larvae of *Clupea sprattus*, *Gadus morrhua* and *Onos cimbrius* in the Gulf of Gdansk in 1939, 1946 and 1947." Ibid.

Mulicki, Z.: "The Food and the feeding habits of the Flounder in the Gulf of Gdánsk." Arch. Hydrobiol. et Ichthyol., Vol. XIII. 1947.

Rumkówna, A.: "A list of the phytoplankton species occurring in the superficial water layers in the Gulf of Gdánsk." Bull. Lab. Mar. Gdynia, No. 4. 1948.

Sweden.

The M/S "Eystrasalt" was kept in commission from April to December and the cruises were extended from the Sound to the northernmost parts of the Baltic area. The research vessel "Skagerak" made a cruise in the southern Baltic in March.

Hydrography.

Many hydrographic observations on temperature, salinity, oxygen content, and hydrogen-ion concentration have been made in connection with the biological investigations.

Plankton.

Quantitative plankton samples were collected with the Hensen net from different parts of the area.

Biology (Harald Alander).

Cod. The stock of cod was investigated and many fishing experiments were made throughout the whole area. Samples were collected and analysed for length, age, and maturity.

Flat Fish. The stock of flat fish was investigated in the southern and central Baltic. Measurements of commercial catches of flat fish were carried out.

Herring. Many fishing experiments were made in order to study the stocks of herring, their changes and migrations inside the Swedish archipelagoes, off the coast, and in the open sea. Samples from all parts of the area were collected and analysed for race, age, and spawning periods.

Sprat. The stock of sprat in the central Baltic and the Sea of Bothnia was investigated.

Eel. About 300 eels were tagged in Kalmar Sound chiefly in order to study the catching power of the pound nets.

Aids to Fishing.

The M/S "Eystrasalt" has been commissioned for locating shoals of herring with the echo sounder in the Baltic area. New types of herring trawls have been tried.

Publication.

Hessle, Chr.: Recent years' increase in the catches of cod in the Swedish fishery. Ann. Biol., Vol. IV.

Reports of other Committees.

HYDROGRAPHICAL COMMITTEE

1948

By

HELGE THOMSEN

Belgium.

No report received.

Denmark.

(HELGE THOMSEN.)

Cruises.

Hydrographic investigations were carried out from the "Dana" in the North Sea and the North Atlantic in connexion with biological work, from 6th May to 14th August. The sections "R" and "S" of the international North Sea scheme were run from 6th to 10th May, Sections "A" and "B" from 12th to 14th June, and section "C" from 12th to 14th August.

The eastern halves of sections "R" and "S" were worked again from 25th—27th September by the rescue ship "F. V. Mortensen".

The four permanent sections off the west coast of Greenland were run by the survey ship "Heimdal" as follows.

Off Frederikshaab: May.
Fylla Bank: May.
Lille Hellefiskebank: September.
Store Hellefiskebank: July, September.

Two sections between Greenland and Canada along latitudes 68°15′ N., and 68°45′ N. were run from 30th August to 3rd September.

Other hydrographic investigations in the coastal waters off West Greenland were carried out from the M/C "Adolf Jensen" and M/C "Steenstrup".

Observations from Liners.

Surface samples were collected from liners on the routes Copenhagen—Greenland and Copenhagen—Iceland, and, from April, also on the route Esbjerg—Grimsby.

Observations from Light Vessels and Coastal Stations.

Regular hydrographic observations have been made by the Danish Meteorological Institute as follows:

1) daily observations of temperature and salinity from 11 light vessels and 16 coastal stations.
2) 4 hourly estimations of the surface current from 11 light vessels.

Éire.

(A. E. J. WENT.)

Owing to the lack of a special research vessel no work was done at sea during 1948. Surface temperatures were taken at Coningbeg Lightship. The results for a number of previous years are in course of compilation.

England.

(J. R. LUMBY.)

Fisheries Laboratory, Lowestoft.

1. **Research Ships.** The routine observations on the Flamborough line were made each month during the year. Observations of salinity and temperature were made in the southern North Sea during January, February, and March in connexion with plaice-egg investigations. Section "U" of the International Survey was covered in February, Sections "T" and "U" in May, and Section "T" in September; observations of salinity, temperature, and oxygen were made. In March, April, May, and June, temperature and salinity observations were taken off the north-east coast in connexion with plankton investigations.

2) **Commercial and Light Vessels.** Routine observations of surface salinity and temperature were continued as in 1947. In June, a thermograph was installed on the Newhaven—Dieppe line.

3) **Ocean Weather Ships.** Surface observations of temperature and salinity were made throughout the year by two of the four British Weather Ships, and from March onward by all four ships, at stations "I" and "J".

Department of Oceanography, Liverpool University.

1) The survey of the temperature and salinity of the surface waters of the Irish Sea, which was started in 1934, was continued, observations and samples being taken three times per week, at each of nine stations. Mr. GILLES has completed, for publication, a statistical study of the data provided by this survey up to the end of 1946.

2) In July and August observations were made of the turbulent fluctuations of the tidal currents in the river Mersey, from the M. V. "William Herdman" anchored at two stations. Mr. BOWDEN has completed, for publication, an analysis of the results of these observations, and this analysis throws much light on the nature of turbulence.

Marine Biological Association, Plymouth.

Monthly cruises have been made in R. V. "Sabella" or M. F. V. "Sula" to the international station E 1, and separate cruises to positions 49°50′ N. 2°22′ W., 50°00′ N. 2°30′ W., 50°05′ N. 3°28′ W., and 50°00′ N. 7°10′ W. have also been made.

Temperature, salinity, phosphate and total phosphorus data have been obtained.

Finland.

(G. GRANQVIST.)

Hydrographic observations were collected from 21 fixed stations (temperature and salinity) and 8 lightships (temperature, salinity, wind and currents), 12 tidal gauge stations, 13 tidal pole stations, and 70 ice stations.

France.

(JEAN LE GALL.)

Navire Océanographique et Bâtiments de Surveillance et de Protection de la Pêche.

Le navire océanographique "Président Théodore Tissier" a entrepris, du 9 Août au 9 Décembre 1948, des croisières successives dans le Golfe de Gascogne, sur le Plateau Continental Celte, en Manche et en Mer du Nord.

Les observations hydrologiques habituelles (relevés de température, prélèvements d'eau en surface et à différentes profondeurs) ont été faites tous les 30 milles sur tous les trajets suivis par le bâtiment.

L'Aviso "Ailette" de la Marine Nationale a effectué diverses sections hydrologiques sur les pêcheries du maquereau à l'entrée occidentale de la Manche et sur les pêcheries de hareng en Mer du Nord.

La Frégate "Aventure" a continué l'étude des conditions hydrologiques sur les lieux de pêche de la morue à Terre-Neuve et au Groënland.

Sections hydrologiques en Manche, poursuivies en collaboration avec les Services du Ministère de l'Agriculture et des Pêches en Grande Bretagne.

Frégate Météorologique. Les observations hydrologiques (températures et prélèvements d'eau en surface et à différentes profondeurs) ont été très régulièrement poursuivies par les Frégates Météorologiques Françaises au point "L", 39° Lat. N.—17° Long. W. Gr.

Observations à bord des navires de pêche. Au cours des sorties du personnel de l'Office Scientifique et Technique des Pêches Maritimes à bord des navires de pêche, des observations hydrologiques ont été faites; sur les pêcheries de la côte Mourmane, en Mer du Nord, en Manche, en Mer Celtique, dans le Golfe de Gascogne et dans le Golfe du Lion en Méditerranée.

Le matériel recueilli est encore à l'étude.

Holland.

(J. W. TERMIJTELEN.)

The following investigations were carried out:

1) Regular observations of surface salinity, temperature, and current measurements at the light vessels "Goeree" and "Texel".

2) Detailed hydrographical surveys (including current measurements) in the Waddensea, south of, and between, the Friesian Islands.

3) Sections U and W of the September international oceanographical survey of the North Sea (28, 29, and 30 Sept.).

Iceland.

(HERMANN EINARSSON.)

During 1948 more extensive investigations were carried out in Icelandic waters than ever before. Three motor vessels were chartered during the year for the purpose of these investigations.

In January hydrographic sections were made in Faxaflói. In February a cruise round Iceland was undertaken. During March and April the investigations were confined to the south and west coast waters. In June the west coast waters and Faxaflói were investigated. In July, August and September cruises around Iceland were made, the main stress being laid on investigations off the north coast in connexion with the summer herring fisheries. A total of 1937 observations were made.

Norway.

(J. EGGVIN.)

The Marine Research Institute of the Fisheries Directorate.

1. Cruises.

During 1948, 4 cruises were undertaken by "Johan Hjort" and 9 cruises by 4 chartered vessels and 2

naval units. Operations were carried out in Norwegian coastal, Svalbard, Islandic, Greenland and Skagerak waters, and in the northern part of the North Sea. 6 of the cruises were in coastal waters, in fjords along the Norwegian coast and in the sea north-east of Norway (Finnmark). Most of the cruises were run in close connection with investigations on cod, herring, sprat, mackerel and other fishes. One of the west coast cruises was carried out in order to study the asdic conditions in the coastal waters of western Norway. The other 6 cruises were carried out in the above-mentioned areas.

The numbers of observations were as follows:

At 627 hydrographical stations, 5000 observations of temperature and 4820 of salinity were made. In addition 1492 analyses of pH, O_2 and P_2O_5 contents were made.

2. Permanent Stations.

At the 8 permanent stations on the Norwegian coast, observations of temperature with collection of samples for salinity were made regularly during the whole year at the standard depths. The deepest observations are from 300 m. at Skrova, Sognesjøen and Lista, from 250 m. off Utsira, from 225 m. at Træna, from 200 m. at Eggum and Ona and 150 m. inside Utsira.

The stations were worked once a week from December to April. In May the observations were taken more frequently and once every week from June to November. The temperature and salinity were sent to the Institute as soon as possible, the temperature telegraphically.

3. The Sea Surface Thermograph Service.

Thermograph records were obtained from 8 liners running on the following routes from Bergen: 1. to Newcastle, 2. to Antwerpen, 3. to Oslo and 4. to Kirkenes (East Finnmark). Water samples were also obtained from these routes.

Thermograph records were also obtained from a collier between Advent Bay, Svalbard, Lat. N. 78°15′, Long. E. 16°04′ and different ports in Norway during the summer and between Scandinavia and U.S.A. during the autumn.

By co-operation between the Norwegian Meteorological Institute and this Institute, sea surface thermograph recorders were installed in the weather ships "Polarfront I" and "Polarfront II" in November, and regular observations are being taken from both ships.

The Flødevigen Sea-Fish Hatchery. Arendal.

(A branch of the Fisheries Directorate.)

Investigations were carried out in the fjords of southern Norway and in the Oslofjord off Ferder. In the Skagerak a section from Torungen light towards the south-east was worked 9 times between 3rd February and 21st December. In all, 103 hydrographical stations were made.

The Geophysical Institute.

The routine programme was carried out in fjords of western Norway and some special investigations were undertaken. In addition to this detailed observations have been made of temperature and salinity in the Sognefjord section from Feie to about 200 nautical miles towards the north—west in May, June and August.

Poland.

(M. Bogucki.)

The Marine Fisheries Institute at Gdynia (formerly Marine Station) carried out observations at 7 fixed stations in the Gulf of Gdánsk every 2 months. As well as temperature readings, samples of water from different depths (every 10 metres) were collected, and the Cl, O_2, and P_2O_5 contents were analysed. One cruise in November was made in the Bornholm Basin taking similar observations.

The following note was published:

A. Głowińska: Hydrography off the Polish Coast. Ann. Biol., Vol. III, 1948.

The paper by A. Głowińska and J. Chmiecik: Bottom Salt Water movement in the Southern Baltic in 1948—is prepared for print in the Polish "Revue Météorologique et Hydrologique".

The State Meteorological Institute at Gdynia made regular daily observations of the surface temperature and salinity at 2 coastal stations: Gdynia and Leba.

Portugal.

(A. M. Ramalho.)

Faute de navire et d'autre moyens, aucune observation hydrographique n'a été faite pendant l'année 1948.

Scotland.

(John B. Tait.)

Scottish Home Department.

Hydrographical work in 1948 was still restricted to temperature and salinity observations, with surface drift-bottle liberations, on account of continued post-war limitation of facilities, but it was carried out somewhat more intensively than in 1947. The bulk of the work was carried out by "Explorer" from April to December inclusive in the North Sea north of the Dogger Bank, the Faroe-Shetland Channel and west Scottish waters. An additional deep-sea research vessel, named "Scotia", was put into commission towards the end of the year and a short trial cruise to the deep region of the Faroe-Shetland Channel was undertaken in December.

Commencing in February 1948, the herring research vessel "Clupea" carried out hydrographical work in conjunction with herring investigations in the Firth of Forth area, off the mid-east Scottish coast, and in the north-western North Sea.

The motor research vessel "Kathleen" also took temperature and salinity observations during the year in course of inshore fishery investigations.

A total of over 3,500 combined temperature-salinity data were thus accumulated in respect of surface, intermediate and bottom waters in the above-named regions. 1445 surface drift-bottles were set adrift in groups of five, the return to the end of March 1949 being about 21 %.

In November 1948 a scheme of weekly drift-bottle liberations was begun from the more northerly (Lat. 60° N., Long. 20° W.) of the two British Weather Ships, supplemented by liberations also on longitudes 10°, 12°, 14°, 16°, and 18° W. *en route* to the above position from the Firth of Clyde at three-weekly intervals.

Scottish Marine Biological Association.

Temperature and salinities are taken daily at Keppel, and the temperature records telephoned each day to Meteorological Office, via Prestwick.

Sweden.

(B. Kullenberg.)

The Swedish Deep Sea Expedition finished on October 3rd, thus having occupied the greater part of the year. For this reason the Swedish hydrographical investigations in home waters have mainly been limited to participation in the international North Sea investigations. The "Skagerak" carried out observations of temperature and salinity in the North Sea and Skagerak during the periods 2nd—13th May, 30th September—1st October, and 6th—8th December.

Regular observations of temperature and salinity were carried out in Gullmarfjord with daily observations at one station, and observations 3 times a month at 4 other stations.

Spain.

(Fernando Balén.)

Instituto Hidrografico de la Marina, Seccion Hidrografica in collaboration with Instituto Español de Oceanografia.

Off the west coast of Africa between the parallels 23°40′ and 26°10′ Lat. North measurements of temperatures and collection of water samples from various depths were carried out in connexion with sounding work from the "Malaspina".

Off Punta de la Sarga and at Villa Cisneros (Rio de Oro) uninterrupted sea level observations were carried out during one month for computing harmonic constants.

PLANKTON COMMITTEE

1948

By

F. S. Russell

Denmark.

(Poul Jespersen.)

1. During the year the investigations into the food of herring in the Bornholm waters have been continued. As long as the herring fishery lasted, herring stomachs have been preserved in order to follow the variations in the composition and amount of herring food.

2. In Isefjord, Seeland, plankton collections have been carried out during the years 1940—43. A report on the occurrence of the holoplanktonic animals in the fjord has been prepared for publication; further reports on the phytoplankton and on reproduction and larval development of bottom invertebrates will appear later on.

3. An investigation on the quantitative distribution of some important plankton animals in the northern parts of the Atlantic, based on collections of samples from the cruises of "Dana" 1947 and 1948, has been started.

4. The working up of material of deep-sea copepods from North Atlantic waters has been continued.

5. An examination of phytoplankton collected during cruises of "Dana" in the North Sea and North Atlantic waters during the years 1946—48 has been continued.

6. During the year regular weekly collections of plankton samples from the light-ship "Halsskov Rev" in the Great Belt have been made. Besides, assimilation experiments have been made once a month during the greater part of the year.

7. In Roskilde Fjord (Seeland) the diatom *Nitzschia frigida* has been found abundantly in the cold winter of 1947. An examination of the occurrence of this cold water species in different seasons of the year has been made and a paper is under preparation.

8. The examination of phytoplankton samples from parts of Praestø Bay (SE. Seeland) has been continued.

9. A paper on the phytoplankton in coastal waters off the south-western part of Jutland ("Waddensea") is ready for printing.

Éire.

(A. E. J. Went.)

No plankton work was carried out during 1948.

England.

Hull (K. M. Rae).

The Continuous Plankton Recorder Survey of the North Sea and north-eastern Atlantic was continued and extended during 1948. The mileage sampled and analysed amounted to 31,000 miles compared with 22,000 in 1947. The records were distributed on the regular routes as follows:

Hull—Rotterdam	(15	records)	1,065 miles
Hull—Hamburg	(9	—)	1,745 —
London—Stockholm	(10	—)	2,745 —
Hull—Copenhagen	(11	—)	3,619 —
Leith—Copenhagen	(13	—)	4,423 —
Leith—Lerwick	(16	—)	2,866 —
Pentland—Iceland	(9	—)	3,928 —
Glasgow—Weather St. "I"	(11	—)	4,752 —
Glasgow—Weather St. "J"	(10	—)	3,560 —
Miscellaneous	(6	—)	2,512

The routes Newcastle to Copenhagen and Leith to Kirkwall to Lerwick were discontinued but a valuable addition was made possible by the generous co-operation of the Geophysical Institute, Bergen, and the Norwegian and Swedish Committees on Ocean Weather Station "M", who arranged on our behalf for the Norwegian Weather Ship "Polarfront I" to tow a Recorder on its voyages to and from Station "M". The first record on this route was obtained in January, 1949.

The availability of the two weather ship lines running into the Atlantic have added considerably to the previous knowledge of the seasonal changes in the plankton at 10 metres depth. The monthly records have afforded interesting comparisons between the quantity and quality of the plankton in the waters

of the Atlantic and the North Sea and it has been possible to trace the apparent movement of a number of *indicator species* from the one to the other. A well defined boundary in the type of plankton has been found consistently where these Atlantic lines cross the 200 fathom contour. To the coastal side there was a rich fauna like that of the northern North Sea and similarly characterised by *Sagitta elegans* while to the seaward side the plankton was sparser but identifiable by the presence of *S. serratodentata*. A summary of these results has been prepared for the *Annales Biologiques* and detailed observations are being prepared for publication in the *Hull Bulletins of Marine Ecology*.

Again, as in 1947, intensive sampling of the plankton of the herring fishing ground was undertaken with the help of drifter skippers who used the Plankton Indicator. The correlations between the numbers of herring caught and the copepods in the plankton were substantially the same as in earlier years, the positive and negative correlations following the same sequence and periodicity to a most striking degree. The contents of herring stomachs taken from the catches of some of the ships using the Plankton Indicator have been analysed.

Work done on the identification and distribution of the planktonic lamellibranch larvae in the North Sea is now being prepared for publication.

The following reports have been published from the Department during 1948:

Lucas, C. E. and Stubbings, H. G.: Continuous Plankton Records: Size Variations in Diatoms and their Ecological Significance. Hull Bull. Mar. Ecol. No. 12, Vol. II.

Marshall, N. B.: Continuous Plankton Records: Zooplankton (other than Copepoda and Young Fish) in the North Sea, 1938—39. Hull Bull. Mar. Ecol. No. 13, Vol. II.

Lowestoft (R. S. Wimpenny).

A number of cruises were carried out during the year in relation to the herring fishery. Between March and May, surveys with the S. T. "Sir Lancelot" in the area of the North Shields herring fishery disclosed a patch of *Calanus finmarchicus* which coincided with herring concentrations in April and May. Observations were taken with a view to estimating the growth-rate of diatoms and the effect of grazing. A preliminary conclusion was that the production of diatoms ceased in May as a result of heavy grazing and not on account of lack of nutrients.

In the East Anglian herring season, using the S. T. "Sir Lancelot" a combined effort was made to find out the effect of phytoplankton on the shoaling of the herring. No very dense patches of phytoplankton were located during the season, but for densities up to 135,000 per $m.^3$ it was found that *Rhizosolenia styliformis* had no effect on the distribution of the East Anglian herring.

Along the Flamborough Line the regular Hensen net hauls were continued each month, the zooplankton maxima of June and September remaining of a similar order to the previous year. Two exotics were noted, both from the station off Flamborough Head, the first being *Spadella cephaloptera* in January, and the second a species of *Agalmopsis* almost certainly *A. elegans* in February. Concentrations of *Rhizosolenia styliformis* did not reach the proportions of the previous year.

The fat content of samples from these stations was unusually high in May, but taking the year as a whole, the percentage was lower than in 1947. The dry weight per cubic metre was also substantially lower.

Fat content was also obtained on a cruise carried out in June in an area off the English east coast, similar to that covered in previous years. Here also the fat content of the Hensen net catch was lower than in 1947.

Atlantic plankton samples have been collected from Ocean Weather Ships' positions "I" and "J" by means of a fine international net hauled from 50 m. to the surface. Samples were taken irregularly until April and weekly thereafter, with some gaps because of damaged nets or bad weather. Two peaks of phytoplankton production were found at each position. At "I" the maxima were in late May and early June and at the end of October and early in November. At "J" the maxima were earlier and less clearly defined.

A second post-war survey of the plaice spawning grounds in the Southern Bight was carried out in the winter and early spring. The estimated production of plaice eggs was 5,000,000,000,000—a figure similar to that of the previous year.

Tests of the sampling efficiency for the Hensen net, and comparisons between the Hensen net and the Hardy Continuous Recorder were carried out on the plaice egg survey, and on a cruise in June respectively.

Some laboratory experimental work was undertaken on the cultures of *Skeletonema costatum*.

Plymouth (F. S. Russell).

Dr. H. W. Harvey has continued investigations on the total phosphorus and phosphate in the sea off Plymouth and its relationship with plankton content, and as a possible index of different water masses. In the English Channel water masses have been encountered containing 11 mg. and others containing 20 mg. phosphorus per cubic metre.

With the object of obtaining more data concerning the relation between the momentary plankton population and the total phosphorus content he has been engaged in developing a meter which registers the water filtered by plankton nets. It is of interest that the eddies or negative pressure set up in the wake of a conical net aid the passage of an unexpectedly large volume of water through the pores of fine meshed nets.

Dr. L. H. N. Cooper has been examining the distribution in the Atlantic in relation to hydrology of the siphonophores, *Muggiaea atlantica* and *M. kochi* which may be indicators of changes in oceanic circulation; the distribution of *M. atlantica* has also been studied in relation to wind drift.

Mr. P. G. Corbin has continued the regular collections with 2 m. ring-trawl; the numbers of young fish have remained low, and *Sagitta* species have been generally scarce. Both *Muggiaea atlantica* and *M. kochi* occurred during the summer of 1948, and in the autumn small numbers of salps and doliolids were taken, as well as considerable numbers of the medusa, *Liriope*.

Mr. Corbin has been doing further work on the identification of the young of *Ammodytes*.

Mr. P. S. B. Digby continued studies on the biology of the smaller copepods. In *Paracalanus*, *Pseudocalanus*, *Oithona*, *Temora* and *Acartia* breeding is continuous in that nauplii are found throughout the year. It would appear that off Plymouth these copepods will pass through four generations in a year in a closely similar manner. It may well be that factors influencing survival of the nauplii and young stages of all the species together may serve to keep the breeding times of the population in step. During the summer Mr. Digby made a number of collections with vertical townets and a modified Clarke-Bumpus sampler to study the vertical distribution of plankton under conditions of continuous daylight in Advent Bay in Spitsbergen.

Dr. Mary Parke has described six new marine flagellates from the plankton, and Mr. D. P. Wilson has described the development of the polychaete *Ophelia bicornis*. Mr. Wilson has made further observations on the factors effecting metamorphosis of these larvae which indicate that the physical form and size of the sand grains is of chief importance.

Port Erin (D. I. Williamson.)

Commencing with the arrival of the motor vessel "William Herdman" in mid-September 1948, work was begun on a comparison of the plankton to the west, south and east of the Isle of Man by routine sampling of defined stations. The area to the west is characterised by deep water and weak tidal currents, and is a herring shoaling ground supporting an important fishery in the summer. The other areas are of comparatively shallow water with strong tidal currents. The flat ground to the east receives water from the rivers of thickly-populated industrialised Lancashire, while the line of stations to the south of the island cuts across the strong tidal currents between St. George's Channel and this eastern area. It is hoped to correlate the plankton distribution with the hydrography and hydrology of the area. The distribution of indicator-species, seasonal changes and vertical distribution in these areas are being compared.

In late September, 1948, the line of stations to the east of the Isle of Man was found to include a spawning ground of Manx herrings, and a study was made of the general distribution of plankton with respect to the spawning area. Copepods, especially *Paracalanus* and *Pseudocalanus*, showed a minimum in the spawning area, which persisted after the herring larvae had dispersed. An account of the distribution and dispersal of the herring larvae is given by Bowers and Smith (Ann. Rept. Mar. Biol. Stat., Port Erin, 1948, No. 61, p. 21).

Tests have been made on the application of both a Hardy Plankton Indicator and a pump to quantitative sampling.

France.

Algeria (F. Bernard).

Le Laboratoire de Zoologie de l'Université d'Alger a continué ses recherches méthodiques sur le plancton local, au moyen de prises d'eau et de pêches au filet fin, fermant ou non, de 0 à 800 mètres de profondeur. La mesure des températures, le dosage des salinités, phosphates, nitrates, ont accompagné ces études. Elles confirment que la couche de production maximum est outre 20 et 200 mètres, avec taux des phosphates et surtout des Flagellés 2 à 6 fois plus grands qu'à Monaco et Banyuls. Des essais sont faits à Tanger. Des mesures d'éclairements avec cellules au sélénium sont en cours. Sur le groupe dominant du microplancton: Flagellés calcaires, Mme Lecal a pursuivi ses travaux, donnant de nombreux résultats sur le pigment, le cycle et la morphologie de ces Protistes autotrophes. Des eaux de Tunisie et du Maroc ont également servi pour ces investigations.

D'une façon générale, les chercheurs d'Alger se tiennent en relation avec ceux du Maroc et de Tunisie, pour opérer avec des méthodes comparables, et tout laisse espérer que les moyens de navigation seront accrus en 1949.

Publications.

Bernard, F.: Rôle des Flagellés dans la transparence marine en Méditerranée. (Bull. Soc. Hist. nat. Afr. Nord, 38, pp. 74—79, 1947).

— Recherches préliminaires sur la fertilité marine au large d'Alger. (Journ. du Conseil, Vol. XV, No. 3, 1948).

Lecal, J.: Sur un Coccolithophoride (*Coccolithus sessilis* Lohm.) commensal d'une Diatomée (*Coscinodiscus* n. sp.). (Bull. Soc. Hist. nat. Afr. Nord, 1948.)

— Sur la nature mélanique des pigments des *Coccolithus* (P.-V. du XIIIe Congrès intern. de Zoologie, Paris, 1948).

Holland.

(B. Havinga.)

It was not possible to carry out any work on plankton during 1948.

Iceland.

(Hermann Einarsson.)

Great stress was laid on plankton investigations in Icelandic waters during 1948. We had two main objects in view.

1. Investigations on the distribution of eggs and fry of fishes.

2. Investigations on the density of copepods and other food organisms of the herring.

For this purpose 629 samples were collected with

the 2 m. stramin net, 641 samples with the Hensen net and 79 samples with the Nansen closing net.

The investigations were carried out in the months January to September.

Norway.

Bergen (Kr. F. Wiborg).

During the spring zooplankton was collected with the Nansen net and the Clarke-Bumpus plankton sampler along the coast of Northern Norway. Special attention was paid to the occurrence and distribution of larvae of cod and haddock.

During the summer horizontal hauls were made with a 1-m. net along the southern and western coast, in the North Sea and in Skagerak in order to investigate the propagations of mackerel and sprat. Vertical hauls with a Nansen net were also made in some fjords on the west coast.

Weekly collections of zooplankton with a Nansen net began in October at two stations in the Lofoten area, and in December at Sognesjøen on the west coast.

The list of zooplankton material collected in previous years has been brought up to date.

Experiments have been made with a new type of whirling vessel for the dividing of plankton samples. The results are ready for printing.

Oslo (Tr. Braarud).

Work on the quantitative phytoplankton material from the permanent oceanographic stations along the western Norwegian coast was continued, the microscopic examination of the samples being completed (Karen R. Gaarder, Ottar Nordli).

Collecting of quantitative phytoplankton material from five depths at weekly stations from Weather Ship "M" in the Norwegian Sea was started in October. The material, which also includes 1-l. surface samples for taxonomic and quantitative work on coccolithophorids, is now being worked up (Haller Nielsen).

Quantitative samples and net samples of phytoplankton from the international North Sea survey, May 1948, were collected. Difficulty in financing the work has delayed the start of the microscopic examination of the material.

In the Oslo Fjord material for studying the phytoplankton distribution in detail from a methodological point of view was collected during the month of July. The distribution of dinoflagellates, horizontally and vertically, was investigated by means of a special sampling device, in connection with temperature, salinity and light determinations. The results are being prepared for publication (Grethe Rytter Hasle).

Experimental work on a "red-water" organism (*Goniaulax polyedra*) and on *Ceratia*, which were kept in Allen culture, was continued (Trygve Braarud and Erling Nordli).

Taxonomic studies on diatoms, dinoflagellates and coccolithophorids from the "Michael Sars" expedition were continued (Karen R. Gaarder).

Poland.

(M. Bogucki).

Plankton samples were collected at intervals of 2 months on 7 stations from the Gulf of Gdánsk.

In November 1948 a cruise was undertaken by the "Michal Siedlecki" between the Bornholm Basin and the Deep of Gdánsk. During this cruise plankton and water samples were collected at 4 stations.

The following papers were published:

Rumek, A.: List of the phytoplankton species occurring in the superficial water layers in the Gulf of Gdánsk (in Polish). Biuletyn Morskiego Laboratorium Rybackiego w Gdyni, No. 4, 1948.

Mańkowski, W.: Plankton investigations in the Middle Baltic during the summer 1938. Ibidem.

— Macroplankton investigations in the Gulf of Gdansk in June—July period 1946. Ibidem.

— The quantitative distribution of eggs and larvae of *Clupea sprattus* L., *Gadus morrhua* L. and *Onos cimbrius* L. in the Gulf of Gdánsk in 1948, 1946 and 1947. Journal du Conseil, Vol. XV, No. 3. 1948.

Scotland.

Aberdeen (J. H. Fraser).

Plankton samples were taken by Scottish research vessels during 1948 for the central and northern North Sea, off Faroe, in the Faroe-Shetland Channel, and off the west coast of Scotland. Collections were made by vertical hauls with the International Standard Fine Silk net and the Hensen net; by horizontal hauls with 1-metre stramin nets towed at various depths between the surface and 250 metres; and by plankton pump. Some details of the plankton distribution, the production of larval fish and a list of rare and exotic species taken during 1948 are given in Volume V of the *Annales Biologiques* under the Northern North Sea and North-Western Area sections.

A study of the indicator species showed a concentration of oceanic species penetrating the Faroe-Shetland Channel, and these included *Sagitta lyra*, *S. maxima*, *S. serratodentata*, *S. elegans arctica*, *Eukrohnia hamata*, *Calanus hyperboreus*, *Metridia longa*, *Dimophyes arctica*, *Galetta australis*, *Lensia conoidea*, *Chelophyes appendiculata*, *Halopsis ocellata*, *Clio pyramidata*, *Diacria trispinosa*, *Dolioletta gegenbauri*, etc. In 1948 there was little evidence of the penetration of the major exotic species into the North Sea east of Shetland, though this area contained *S. serratodentata* in small numbers during April. There was strong evidence of penetration of oceanic water into the northern North Sea and Moray Firth *via* the passages south of Fair Isle, bringing with it *S. serratodentata* and *Laodicea undulata* in spring, *Dolioletta gegenbauri* and *Cosmetira* in summer, and *D. gegenbauri*, *Lensia conoidea* and *Rhincalanus nasutus* in autumn. A single specimen of *Sagitta lyra* was found in the Moray Firth in December.

Sagitta elegans continued to be found in areas of mixed Atlantic and coastal water but was noticeably less abundant in 1948 than in previous years. *S. setosa*,

characteristic of indigenous North Sea water, was found in the eastern and central North Sea areas from which it penetrated north-westwards as far as the east, but not the west, of Fair Isle, and as far north as 61° N. in the region of 2° E. *S. hexaptera* was found in the Faroe Channel in December, and *S. planctonis* and *Krohnitta subtilis* in deep water off the west Scottish coast in July.

As in previous years, the only species of doliolid found in Scottish waters was *D. gegenbauri*. *Ihlea asymmetrica* was the only salp found in 1948, represented by a single disintegrating specimen found off the west coast.

Calanus finmarchicus, though widely distributed in the whole area investigated was never captured in abundance in 1948 except in the neighbourhood of Faroe. *Calanus helgolandicus* was also widely distributed in the northern North Sea, off the west Scottish coasts, at least as far west as the 200-fathom line, and in the southern half of the Faroe-Shetland Channel. It was apparently absent from the northern half of this Channel and from Faroese water.

Millport (S. M. Marshall).

A statistical analysis was made by Dr. H. Barnes of replicate hauls taken with a modified standard net fitted with the Nansen closing device. The coefficient of variation of a single estimate for a plankton haul taken under the conditions and with the technique used here is of the order of 30%.

In view of the suggestion that variation in the hauls might be caused by variation in the amount of water filtered some experiments were carried out using a pump where the volume filtered can be accurately measured. A small number of replicate hauls were taken and analysed. The results indicate that the normal technique used in transferring the collected plankton from the net to the storage vessel gives rise to considerable errors but even when these are eliminated the results obtained show little improvement.

A statistical analysis was also made of paired divided and undivided vertical hauls taken with the same net. It was found that when all the animals were below the point of division of the haul there was often a very significant loss in the divided haul compared with the undivided even though under these conditions no animals are caught above the point of division. When the animals are all above the point of division of the haul there is no significant difference between divided and undivided hauls (although the error of a single estimate was very large), and when the animals are found both above and below the point of division the error varies with the proportion above and below.

It is suggested that the closing method used is unreliable and should be abandoned for quantitative work.

Since the estimation of volume of water samples taken with a plankton pump is important, a device has been made by which the volume at the pump by-pass has been measured, and it has been shown that under the conditions laid down this can readily be calibrated in terms of the volume pumped. An apparatus has been set up using a thermionic relay to give a signal for the beginning and ending of the collection of water.

Some experimental work has been begun with the object of finding out to what extent plankton animals can avoid the mouth of a suction pump.

Observations were made on the occurrence of the planktonic larvae of the European oyster (*Ostrea edulis*) in the waters of an arm of Loch Sween on the west coast of Scotland. At weekly intervals samples of 1,000 litres were pumped from a depth of 0·6 metres and filtered through a plankton net, and the oyster larvae counted and measured. Similar observations were made in a breeding pool on the Island of Easdale, near Oban. During artificial breeding experiments in a concrete tank the vertical distribution of oyster larvae was studied and was correlated with vertical differences in salinity.

Routine plankton hauls were made every fourth day for the first three weeks of January, from then until February 4th these hauls were made every two or three days. From February 4th until April 30th (inclusive) hauls were made daily.

All these routine hauls were made by fishing plankton nets from Keppel Pier, during the ebb tide. The nets were immersed for approximately one hour on each occasion, from one hour after high water until two hours after high water.

A number of day and night hauls, using a pump, were made during March and early April.

Spain.

(J. Cuesta.)

By the littoral laboratories of the Instituto Español de Oceanografia, samples of plankton have been taken weekly.

The Laboratory of Santander has reestablished the Station II, situated two miles offshore, with planctonic catches in relation to the studies of biology of sardine and anchovy. Two weekly catches of plankton continued in the St. I, inside the Bay.

The material of several years is being studied for establishing the seasonal variations of each region.

Also catches of plankton have been effected in the Gibraltar Strait, by the S. S. "Xauen".

Sweden.

(H. Höglund.)

No plankton investigations have been undertaken during 1948.

SALMON AND TROUT COMMITTEE

1948

By

KNUT DAHL

THE manufacture of tags for 1949 has been proceeding satisfactorily and the quota for 1949 taggings has been distributed.

Belgium.

No salmon work has been done in Belgium.

Denmark.

(C. V. OTTERSTRØM and ERIK M. POULSEN.)

1. Biological Investigations.

The biological investigation of salmon and trout rivers in order to work out plans for liberation of salmon and trout fry has been continued. The investigations on the maiden silvery trout, wintering in the lower parts of the rivers, for age, food and migration habits, as well as on the spring descent to the sea of the young sea trout (time of descent, age and length of the fish and the coincidence of the descent of the trout with that of the silvery eel) have been carried on. Samples of scales and stomach contents of trout have been collected in rivers and estuaries, and information has been collected about which rivers are entered by salmon and sea trout and how far the fish penetrate into the individual rivers, as well as the positions of the spawning places. 43 spent sea trout, used for artificial propagation, and 21 maiden silvery sea trout have been tagged by means of celluloid tags in the dorsal fin in the month of December; until early in March 1949 9 recaptures (14%) have been reported.—The investigations on the Faroe trout were continued during July and August.

2. Artificial Propagation.

Hatchery operations were carried out as usual at a number of centres, and, with the support from public funds, fry and half-yearling, especially of sea trout, have been liberated in rivers with free access to the sea.

3. Statistics.

The collection of information on the yield of the salmon fishery, as well as the weight of individual salmon and sea trout in the river Gudenå and Randers fjord, has been continued and supplemented by investigations in order to elucidate the age and length composition of the stock of spawning sea trout in some other waters (Roskilde fjord, river Lindenborg å).

4. Publications.

OTTERSTRØM, C. V.: "Baltic Salmon and Trout. Guide to Determination." Journ. du Conseil, Vol. XV, No. 2, 1948.

LARSEN, KNUD: First Report on the effect of the Liberation of Salmon and Trout Fry in the Gudenå 1946 47." Rep. Dan. Biol. Stat., XLIX, 1946, 1948.

Ireland (Éire).

(A. WENT.)

1. Biological Investigations.

During the year investigations into the age and growth of salmon of the Rivers Owenea and Shannon were carried on. In addition material relating to the salmon stocks of a large number of Irish rivers in the year 1946 was investigated, but at the close of the year this investigation was not completed.

Preliminary tagging experiments were carried out along the west coast of Ireland at two places (Keel and Dooega on Achill). In all 117 fish were tagged and returns of 32 tags have been recorded to date. Recaptures were made as far as 220 miles (350 km.) north of the place of marking and 30 miles (48 km.) south of the place of marking. A report on these investigations was accepted for publication early in 1949.

In the year 1942 a large material relating to the brown trout of a lake in the south-west of Ireland was collected and a start was made on the investigation of this material during 1948. Similarly a small amount of material from another lake in the west of

Ireland which at one time contained no stocks of trout but had been artificially stocked was investigated during the year.

2. Artificial Propagation of Salmon and Trout.

Hatchery operations were carried out at a large number of centres during the year and the output was considerably in excess of that of the previous year. For the first time for many years imported ova were obtained from Great Britain.

3. Returns of Catches.

Returns of catches were demanded from every holder in 1948 of a license to fish for salmon and these returns are in a course of compilation. The figures for 1947 were completed during the year. The catch recorded was approximately 740,000 kg. or the same order as that for 1946. The export figures published monthly by the Department of Industry and Commerce for 1948 give some idea of the relative abundance of salmon. In that year 887,000 kg. of salmon were exported to Great Britain compared with 560,000 kg. in 1947. In many rivers in the country the runs of salmon, particularly summer fish, were exceedingly good and drift-net fishing off the north and north-west coasts gave improved results when compared with previous years.

4. Papers published or in Press.

O'Driscoll, Denis: "Salmon of the Drumcliffe River." Sci. Proc. R. Dublin Soc. (in press.)

Went, Arthur E. J.: 1948. "Salmon and Sea Trout of the River Inny." Sci. Proc. R. Dublin Soc. 24, N.S., No. 29.

— "Sea Trout of the Owengowla (Gowla River)." Sci. Proc. R. Dublin Soc. (In press.)

— "Movements of Salmon in the Sea. I Achill, Co. Mayo. (1948)." Journal d'Agriculture, Dublin. (In press.)

Copies of these papers will be circulated to members of the Committee in due course.

5. History of Irish Fisheries.

Investigations were continued into the history of a number of fishing weirs on Irish rivers but the survey was not completed by the end of the year.

England and Wales.

(F. T. K. Pentelow.)

In 1948 the tagging of salmon in the sea at Whitby was continued in accordance with the decision of the Committee at Stockholm in 1946. 61 salmon and 8 sea trout were tagged during the months from May to August. 11 tagged fish, 9 salmon and 2 sea trout have been returned.

Finland.

(T. H. Järvi.)

The yield of the salmon fishery in 1948 was still very good, but declining. The following liberations were made:

River	Number	
	Salmon fry	One-summer-old parr
Kemi	806,390	25,790
Oulu	67,180	6,150
Kokemäki	124,270	—
Kymi	—	2,835
Total...	997,840	34,775

Publication.

Järvi, T. H.: "On the Periodicity of Salmon reproduction in the northern Baltic Area and its Causes." Rapp. et Proc.-Verb., 119, 1948.

France.

(R. Vibert.)

1. Recherches Physiologiques et Biologiques.

Les travaux sur la physiologie et la biochimie du saumon entrepris dans le bassin de l'Adour depuis 1945 par Monsieur le Professeur Fontaine sont poursuivis. Une communication pourra être faite au congrès sur "les recherches sur le milieu intérieur du saumon et le fonctionnement des glandes endocrines au cours de son développement et de ses migrations".

Les travaux entrepris par Monsieur Vibert sur la croissance, l'age des saumons, leur cycle génétique et leurs races, sont terminés pour la période 1942—1948. Une communication pourra être faite au congrès sur "l'existence de races à croissance rapide et de races à croissance lente". Une deuxième communication pourra être faite sur les "conditions d'incubation et de développement des oeufs et alevins de truite et saumon sous les graviers".

2. Propagation artificielle du Saumon.

Récolte d'oeufs faible pendant l'hiver 1947—48 comme le stock de saumons de l'année 1947. Récolte par contre importante pendant l'hiver 1948—49: 1,000,000 d'oeufs avec une seule nasse.

Les déversements d'alevins de saumon exécutés en 1948 ont donc été peu importants: 160,000 pour le bassin de l'Adour; 40,000 pour les fleuves côtiers normands.

3. Prises de Saumons.

A noter pour l'année 1948 une nette amélioration du stock des petits saumons (A. 2. et A. 2 +) du bassin de l'Adour faisant suite à l'amélioration du stock des grilses en 1947.

Holland.

(G. J. Lienesch.)

During 1948 there has been no special research on the salmon.

In August a meeting was held in Basel with representatives of Switzerland, France, Bizone and the Netherlands, on salmon fishing on the Rhine. The salmon agreement of 1896 was no longer operative,

and the purpose of this meeting was to ascertain the possibility of reviving the agreement.

There has been no further progress in this connexion during 1948, although the meeting recommended a further conference of delegates from the countries concerned. The general opinion about the salmon fisheries on the Rhine was not quite clear; thus from certain sides there was doubt expressed about the economic results of a reconstituted stock of salmon.

In any case it seemed evident that there ought to be renewed contact between the delegates of the interested countries in order to set up a new financial plan on which further operations can be based.

Salmon catches in the Netherlands have been poor during recent years, and there is no longer any important industry based on the Rhine salmon. In such circumstances it is rather difficult to undertake the major part of the financial contribution if there is not the assurance that fishing on the Rhine outside the Netherlands will not take place during the dangerous period for the young salmon.

During 1948 the total catch of Rhine salmon was 347 fish (with floating nets). In 1947 the amount was 233 fish.

Iceland

(Thor Gudjonsson.)

1. Biological Work.

Some 1600 samples of salmon scales were collected for growth studies and age determination. These came mostly from salmon caught in the tributaries of the rivers Ölfusa—Hvita and Hvita in south-western Iceland.

Marking and tagging of salmon took place as a part of the international tagging experiment. 297 smolts were marked by cutting fins (the adipose and the anal) and 118 were tagged by celluloid buttons with the inscription Isl-V and numbers. The marking and tagging was done on smolts caught in the river Ulfarsa (Korpulfsstadaa). One tag has been returned. It was found in the stomach of a cod, which was caught at a distance of 5 km. from the estuary 5 days after the tag was put on.

291 kelts were tagged by celluloid tags. These were released in the following rivers: Ellidaa near Reykjavik 103 kelts, Stora Laxa 55, Sog 20, Flokadalsa 49, Nordura 64. The rivers Stora Laxa and Sog are tributaries of the Ölfusa—Hvita and the rivers Flokadalsa and Nordura are tributaries of the Hvita. Two tags have been returned. One came from a kelt tagged in Stora Laxa River. It was found on the dead fish close to where it had been released a fortnight previously. The other was also found on a dead kelt which had been released in the river Ellidaa, in Kollabay, at about 15 km. from the estuary 12 days after the kelt had been liberated.

In the summer of 1948, 29 grilse were recaptured from the 401 smolts that had been marked in the spring of 1947 in the river Ulfarsa by cutting off the adipose and the left ventral fins. The return from this marking was thus 7·2%. The salmon run of the river Ulfarsa consists predominately of grilse. No marked salmon was caught elsewhere.

2. Artificial Propagation.

Hatchery operations were carried out at five centres, three of which are for salmon, one for sea-trout, and one for lake char.

3. Statistics.

Complete returns of catches of salmon and trout are not available. The catches of salmon by anglers indicate that the total catch was about 15% higher than in 1947, the catch of that year being 15600 salmon. Thus the total salmon catch for 1948 would be close to 18000 salmon, the average individual weight being 4 kg.

Norway.

(Knut Dahl.)

Salmon and Sea Trout Research (L. Rosseland).

As in previous years, research has mainly consisted of the tagging of sea trout and salmon, and the collection of stomach contents and sexual organs o salmon.

In two rivers viz. the Sanvikselv near Oslo and the Istra in the Romsdal, we have begun an attempt to study the whole economy of the river. The exact counting and recording of all descending and ascending fish combined with a tagging of a certain number of the stock has been attempted, but owing to mishaps and to lack of assistance these experiments could not be continued in the 1948 season.

The Sandvika River. The river was closed with a temporary netting fence in the first days of May and all descending smolts of salmon and sea trout were tagged, a total of 1507 salmon and 1510 sea trout smolts. The descent commenced on the 10th May a few days after the spring floods had passed and the main body of the smolts migrated during the month of May. On account of other work the smolt fence had to be abandoned on 2nd June. At that time a few migrants were still to be seen, but only small numbers after this date. For the tagging we used Lea's tags for smolts as far as possible, although only about 10,000 were available, and we had to resort to a paper tag with a photographed legend dipped in celluloid (sample to be exhibited), which we constructed ourselves.

These tags appear to be reliable for recaptures during the first summer after migration. Whether they will keep longer it is as yet too early to judge. Of the salmon smolts tagged, 7 recaptures have been reported, all shortly after the tagging.

The last recapture was reported on 19th June, and all were reported from the inner Oslo fjord.

Of the tagged sea trout smolts 33 individuals have been recaptured up to the present time (1st of

July) all in the inner part of the Oslo fjord. At the end of July the Sandvika River was fenced again to try and catch the ascending fish. Some time after this the fence was destroyed by an unusually heavy flood, and we were unable to rebuild it.

Istra. In the Istra at the end of June we built a strong fence, partly of iron rods instead of netting. In connection with the fence we also built a trap to catch ascending fish. As the summer advanced, and before the fish had really commenced their ascent, the fence was partly ruined by a flood. The fence was rebuilt, but an excessive flood swept it into the sea. No fish were tagged.

Sea Tagging was continued at the same 2 stations as in past years, Kinn and Titran. At Kinn a total of 133 salmon and grilse were tagged and stomach contents and sex organs of 174 salmon and grilse were preserved. Up to March 22 (1949) 54 recaptures, 2 from British rivers, have been reported, or 40%.

At Titran we tagged 69 salmon and grilse, and obtained 22 recaptures, or 32%. While fishing for brood fish in the Lier-River we tagged 85 spent sea trout from which 7 recaptures have been recorded up to the 1st of July 1949.

Tagging of Kelts.

In the Lerdal river, from 12—20th of April, we tagged 35 salmon kelts, the river being reported unusually full of kelts this winter. No recaptures have yet been obtained.

Poland.

(M. Bogucki.)

Artificial fertilization was continued, although on a diminished scale in comparison with the previous year. Only 2,650,000 trout eggs and 100,000 salmon eggs were hatched. During the spring season 840 smolts and 2-year-old trout were tagged and liberated in the river Dunajec. Analysis of the age-composition of the 1948 catches was carried out.

Scotland.

(C. E. Lucas.)

We have received a manuscript ready for publication from C. E. Lucas of the Scottish Home Department, Aberdeen, relating to taggings carried out by that Department at the two coastal stations of Rockall and Boddin, in the vicinity of Montrose, between 2nd May and 1st August 1948. A total of 121 salmon (37 salmon and 84 grilse) were marked, and, in addition, 10 sea trout were marked at the Boddin station. Up to the date of this report (6.VI.) out of these 121 fish marked 47 fish have been recaptured, all being taken before 31st December 1948. All taggings were done with the hydrostatic or Norwegian pattern mark. (The complete report will be filed for the present, and eventually laid before the Committee in Edinburgh for further consideration.)

Spain.

(J. Cuesta.)

During 1948, the protection of salmon rivers, initiated in previous years, was intensified by the "Servicio Nacional de Posea Fluvial", and as a result the catches have shown an important increase.

For the rivers of Santander province the catches of the last three years have been as follows:

Rivers	1946		1947		1948	
	No.	Kg.	No.	Kg.	No.	Kg.
Ason.....	40	266	110	524	318	1,876
Pas.....	13	84	7	31	117	589
Nansa	77	431	245	1,167	512	2,866
Deva-Cares	167	962	384	2,079	617	3,501

During the last two years two salmon ladders have been constructed in the river Ason, one in the river Deva, and another in the river Nansa.

The rivers had also been improved in other ways, for example, the provision of passes and of shelters for fishermen.

Difficulties have made the tagging of smolts impossible.

Scales of many specimens of salmon caught during 1948 are being studied.

Sweden.

(N. Rosen.)

In 1948 the following tagging and marking experiments were carried out:

(a) a number of salmon used for artificial propagation were tagged and liberated in the Baltic rivers Mörrum, Dal, Indal and Ume;

(b) a number of salmon ascending the Baltic river Ångerman were caught, tagged and liberated in the same river;

(c) the following number of young salmon were marked by cutting the fins, and liberated: 4,000, two summers old, in the river Lule; 30,000, one summer old, in the river Indal; 55,000, one summer old, in the river Dal; and 15,000, one summer old, in the river Mörrum;

(d) 34 salmon were caught, tagged and liberated, in the river Ätran;

(e) 4 salmon were caught tagged, and liberated, in the sea off the west coast of Sweden;

(f) 42 sea trout were caught, tagged, and liberated, in the river Ätran;

(g) 15 sea trout were caught, tagged, and liberated, in the sea near the mouth of the river Ätran. One of them was recaptured in the same place and in the same bag-net after a month and liberated again.

Samples of scales of a great number of salmon from several rivers and from the Baltic have been collected.

Experiments with electric fishing have been carried out, as well as feeding experiments of different kinds at several places.

A review of the statistics concerning the Swedish

catches of salmon in the Baltic 1920—1948 shows there to have been a great increase from 1942 to 1946, after which year there was a decline; the yield, however, is still much higher than before 1943.

Publication.

ROSEN, N.: "On the salmon of the west coast of Sweden." Svenska hydrograf.-biolog. komm. Skr. N. S. Biologi, Bd. II, Nr. 10.

Addendum.

No report was received in Copenhagen last year from Poland although it seems that a report had been sent in by Mr. BOGUCKI, but was lost in transmission. However, through the agency of Dr. ALM, a copy of this report has now been received from Mr. BOGUCKI, and will be placed before the committee at the meeting in Edinburgh.